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N. Hadley Junr.

John Marmaduke Teesdale.

87655

Barr's Buffon.

Buffon's Natural History.

CONTAINING

A THEORY OF THE EARTH,
A GENERAL
HISTORY OF MAN,
OF THE BRUTE CREATION, AND OF
VEGETABLES, MINERALS,
&c. &c.

FROM THE FRENCH.

WITH NOTES BY THE TRANSLATOR.

IN TEN VOLUMES.

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THE EIGHTH VOLUME.

Of Carnivorous Animals.

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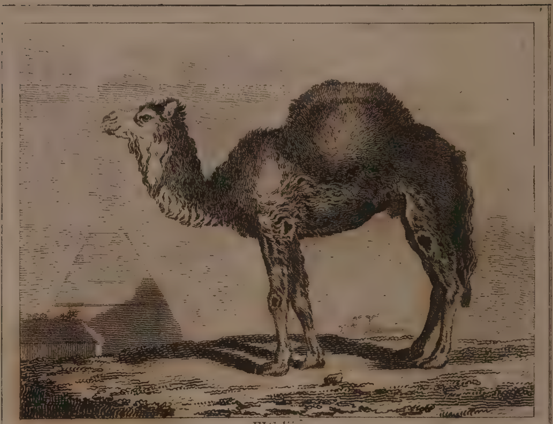

FIG.135.

Camel

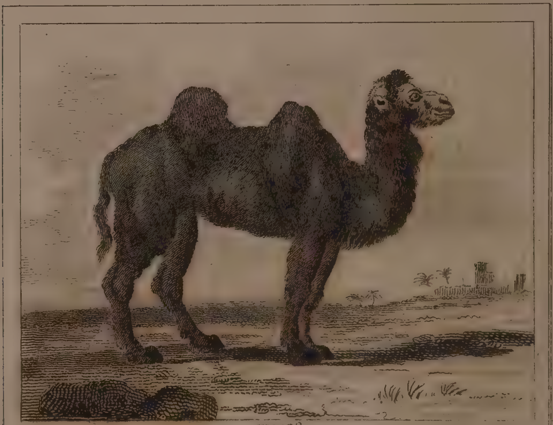

FIG.136.

Dromedary

BUFFON'S

NATURAL HISTORY.

THE CAMEL AND THE DROMEDARY.

THESE two names do not include two different species, but only two distinct races, subsisting from time immemorial in the camel species. The principal, and perhaps the only perceptible character by which they differ, consists in the camel's bearing two hunches on the back, and the dromedary only one, who is also less, and not so strong as the camel; but both of them herd and intermix together, and the production from this cross breed is more vigorous, and of greater value, than the others.

These mongrels form a secondary race, which mix and multiply among themselves, and with the first race; so that in this species, as well as in that of other domestic animals, there are many varieties, the most general of which are relative to the difference of climate. Aristotle has judiciously marked the two principal races; the first, which has two bunches, under the name of the *Bactrian Camel;* and the second under that of the *Arabian Camel:* the first are called *Turkish* and the others *Arabian Camels*. This distinction still subsists, but it appears, since the discovery of those parts of Africa and Asia which were unknown to the ancients, that the dromedary is, without comparison, more numerous and more universal than the camel: the last being seldom found in any other place than Turkestan, and some other parts of the Levant; while the dromedary, more common than any other beast of burthen in Arabia, is found in all the northern parts of Africa, from the Mediterranean to the river Niger, and is also met with in Egypt, in Persia, in South Tartary, and in all the northern parts of India. The dromedary, therefore, occupies an immense tract of land, while the camel is confined to narrow limits. The first inhabits hot and parched regions; the second, a more moist soil and temperate climate; and the whole species, as well the one as the other, appears to be confined to a zone of three or four hundred leagues in breadth, which spreads from Mauritania to China; for they subsist neither above nor below this zone; and although a native of warm climates, this animal is averse to those where the heat is excessive; his species ends where that of the elephant begins, and it cannot exist either under the burning heat of the torrid zone, or in the milder climates of the temperate. It appears to be originally a native of Arabia; for that is not only the country where there are the greatest number, but where they seem to be in the best condition. Arabia is the most dry country in the world, and one in which water is the most scarce. The camel is the least thirsty of all animals, and can pass several days without any drink. The land is almost in every part dry and sandy. The feet of the camel are formed to travel in sand; and he can not support himself on moist and slippery ground. Herbage and pasture are wanting to this country, as is also the ox, whose place is supplied by the camel.

We cannot be deceived as to the native country of these animals, when we consider their nature and structure which must be conformable thereto; especially when those are not modified by the influence of other climates. It has been tried, but without effect, to multiply camels in Spain; they have also in vain been transported to America, but they have neither succeeded in the one climate, nor in the other, and they are seldom to be met with in the East Indies beyond Surat and Ormus: not that we mean to say absolutely that they cannot subsist and increase in the East Indies, Spain, America, and even in colder countries, as in France, Germany, &c. By keeping them during the winter in warm stables, feeding and treating them with care, not letting them labour, or suffering them to walk out but when the weather is fine, they might be kept alive and we might even hope to see them multiply; but such productions are small and imbecile, and the parents themselves are weak and languid. They lose, therefore, all their value in these climates, and, instead of being useful, they are very expensive to bring up, while in their native country they may be said to compose all the wealth of their masters.

The Arabs regard the camel as a present from Heaven, a sacred animal, without whose aid they could neither subsist, trade, nor travel. The milk of these beasts is their common nourishment:

rishment: they likewise eat their flesh, especially that of the young ones, which they reckon very good. The hair of these animals, which is fine and soft, and is renewed every year, serves them to make stuffs for their clothing and their furniture. Blest with their camels, they not only want for nothing, but they even fear nothing. In a single day they can traverse a tract of fifty leagues into the desert, and thus escape from their enemies. All the armies in the world would perish in pursuit of a troop of Arabs; and hence they are no further submissive than they please. Let any one figure to himself a country without verdure and without water; a burning sun, a sky always clear, plains covered with sand, and mountains still more parched, over which the eye extends and the sight is lost, without being stopped by a single living object; a dead earth constantly whirled about by the winds, presenting nothing but bones, flints scattered here and there, rocks perpendicular, or overthrown; a desert entirely naked, where the traveller never drew his breath under a friendly shade, where nothing accompanies him, and where nothing reminds him of an animated nature; an absolute solitude, a thousand times more frightful than that of the deepest forests; for trees appear as beings to the man, who thus desolate, thus naked, and thus lost, in an unbounded void, looks over all the extended space as his tomb: the light of the day, more dismal than the shade of the night, serves but to renew the idea of his own wretchedness and impotencies, and to present before his eyes the horror of his situation, by extending round him the immense abyss which separates him from the habitable parts of the earth; an immensity which he, in vain, attempts to overrun; for hunger, thirst, and burning heat, haunt every weary moment that remains between despair and death.

Nevertheless, the Arab has found means, by the aid of the camel, to surmount these difficulties, and even to appropriate to himself these frightful gaps of Nature: they serve him for an asylum, they secure his repose, and maintain his independence.---But why does not man know how to make use of any thing without abuse? This same free, independent, tranquil, and even rich Arab, instead of respecting these deserts as the ramparts of his liberty, sullies them with his guilt; he traverses them to rob the neighbouring nations of their slaves and gold; he makes use of them to exercise his robberies, which, unfortunately he enjoys more than his liberty; for his enterprizes are almost always successful. Notwithstanding the caution of his neighbours, and the superiority of their forces, he escapes their pursuit, and carries away with impunity all that he has plundered them of.

An Arab, who destines himself to this business of land piracy, early hardens himself to the fatigue of travelling; he accustoms himself to the want of sleep, to suffer hunger, thirst, and heat. For the same purpose he instructs his camels, he brings them up, and exercises them in the same method. A few days after their birth, he bends their legs under their bellies, forces them to remain on the earth, and in this situation loads them with a heavy weight, and which he only relieves them from to put on greater. Instead of suffering them to feed at pleasure, and to drink when they are thirsty, he regulates their repasts, and by degrees increases them to greater distances between each meal, diminishing also, at the same time, the quantity of their food. When they are tolerably strong, he exercises them in the course; he excites their emulation by the example of horses, and by degrees renders them as swift, and more robust. At length, when he is assured of the strength and swiftness of his camels, and that they can endure hunger and thirst, he then loads them with whatever is necessary for his and their subsistence, departs with them, arrives unexpected at the borders of the desert, stops the first passenger he sees, pillages the straggling habitations, loads his camels with his booty, and if he is pursued, if he is obliged to expedite his retreat, it is then that he displays all his own, and his animal's talents. Mounted on one of his swiftest camels, he conducts the troop, makes them travel day and night, almost without stopping either to eat or drink; and in this manner, he easily passes over the space of three hundred leagues in eight days; and during all that time of fatigue and travel, he never unloads his camels, and only allows them an hour of repose, and a ball of paste each day. They often run in this manner for nine or ten days without meeting with any water, and when, by chance, there is a pool at some distance, they smell the water at more than half a league before they come to it. Thirst makes them redouble their pace, and then they drink enough for all the time past, and for as long to come; for they often travel many weeks, and their abstinence endures as long as they are upon their journey.

In Turkey, Persia, Egypt, Arabia, Barbary, &c. all their merchandize is carried by camels, which of all conveyances is the most ready and cheapest. Merchants and other travellers assemble themselves in caravans to avoid the insults and robberies of the Arabs. These caravans are often very numerous, and always composed of more camels than men. Each camel is loaded according to his strength,* and of this they are themselves so conscious that when overloaded they refuse to proceed, but remain in their resting posture till their burthen be lighted.

Large camels generally carry 1000, or even 1200lbs. weight, and the smaller 6 or 700. In these commercial journeys, they do not travel quick, and as the route is often seven or eight hundred leagues, they regulate their motions and journeys; they only walk, and go every day ten or twelve leagues; they are unloaded every evening, and are suffered to feed at liberty. In a country where there is plenty of pasture, they eat enough in one hour to ruminate the whole night, and to serve them twenty-four; but they seldom meet with such pastures, and this delicate food is not necessary for them. They even seem to prefer wormwood, thistles, nettles, furze, and other thorny vegetables to the softest herbs; and as long as they

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* The Orientalists call the camel the *ship of the desart*, alluding to the heavy loads which it carries.

they can find plants to brouze on, they easily dispense with drink.

But, this facility, with which they abstain so long from drink, is not pure habit, but rather an effect of their formation. Independently of the four stomachs, which are common to ruminating animals, the camel is possessed of a fifth bag, which serves him as a reservoir to retain the water. This fifth stomach is peculiar to the camel; it is so large as to contain a great quantity of water, where it remains without corrupting, or the other aliments being able to mix with it. When the animal is pressed with thirst, or has occasion to macerate his dry food for ruminating, he causes a part of this water to re-ascend into the paunch, and even into the œsophagus, by a simple contraction of the muscles. It is, therefore, by virtue of this very singular conformation, that the camel can remain several days without drink, and that he can take at one time a prodigious quantity of water, which continues pure and limpid in this reservoir, because neither the liquors of the body, nor the juices of digestion are able to mix with it.

If we compare the deformities, or rather the non-conformities of the camel with other quadrupeds, we cannot doubt but his nature has been considerably altered by constraint, slavery, and continual labour. The camel is the most completely, the most laboriously, and the most anciently enslaved of all domestic animals; the most anciently, because he inhabits climates where man was the most early civilised; the most completely, because in the other species of domestic animals, such as the horse, the dog, the ox, the sheep, the hog, &c. we find some individuals in their natural state, which have not yet been subjected by man; but the whole species of the camel is enslaved, and not any of them are to be found in their primitive state of independence and liberty; and lastly, he is the most laborious slave, because he has never been trained, either for shew, as are many horses, or for amusement, as are almost all dogs, or for the use of the table, as are the ox, the hog, the sheep, &c. He is the only beast of burden whom man has not harnessed, or taught to draw, but whose body is looked upon as a living carriage, which may be loaded and oppressed, even during his time of rest; and when in haste sleeps under the pressure of a heavy burden, his legs bent under him, and the weight of his body resting upon his stomach. This animal always bears the marks of slavery and pain. Below the breast, upon the sternum, there is a large callosity, as tough as horn, and similar ones upon the joints of his legs; although these callosities are to be met with on every camel, yet they themselves prove that they are not natural, but produced by excessive constraint and pain, from being often found filled with pus. The breast and legs, therefore, are deformed by these callosities: the back is also disfigured with a double or single hunch, and both these hunches and callosities are perpetuated from one generation to another. As it is evident, that the first deformity proceeds from the custom of forcing them when quite young to lay on their stomachs, with their legs bent under them, and in that cramped posture, to bear not only the weight of their bodies, but also the burthens which are put upon them; it must be presumed, that the hunch or hunches, owe their origin to the unequal compression of heavy burthens, which may have raised the flesh, and puffed up the fat and skin; for these hunches are not bony, but composed of a fleshy substance, partly of the same consistence as the udder of a cow. Thus the callosities and the hunches should be equally regarded as deformities produced by the continuance of labour, and constraint of body; and though at first accidental and individual, they are now become general and permanent in the whole species. It may also be presumed, that the bag which contains the water, and which is only an appendix to the paunch, has been produced by a forced extension of this viscera. The animal after enduring thirst for a long time by taking at one time as much, and, perhaps more water than the stomach could contain, this membrane would become extended and dilated, as has been observed in the stomach of sheep, which extends and acquires a capacity in proportion to the quantity of its aliment. The stomach is very small in sheep that are fed with grain, while it becomes very large in those that are fed with herbage.

These conjectures would be fully confirmed, or destroyed, if any of these animals could be found wild to compare with the domestic; but these animals do not exist any where in a natural state, or if they do, no one has yet remarked or described them; we must, therefore, suppose, that all which is good and fair about them they owe to Nature, and that all that is defective and deformed is occasioned by the labour and slavery imposed on them by the empire of man. These poor animals must suffer a great deal, as they make lamentable cries, especially when overloaded; but, notwithstanding they are continually oppressed, they have as much spirit as docility. At the first sign they bend their legs, and kneel upon the ground, to be loaded, thus saving the trouble of lifting up the burden to any great height. As soon as they are loaded they raise themselves up again without any assistance, and the conductor, mounted on one of them, precedes the whole troop who follow in the same pace as he leads. They want neither whip nor spur, but when they begin to be fatigued their conductors support their spi ri, or rather charm their weariness, by a song, or the sound of some instrument. When they want to prolong the day's journey they give the animals but one hour's rest, after which, renewing their song, they proceed on their way for several hours more, and the singing continues until they come to another resting place; then the camels again kneel down, and are eased of their loads, by the cords being untied, and the bales rolling down on each side. In this cramped posture, with their bellies couched upon the earth, they sleep in the midst of their baggage, which is tied on again the next morning with as much readiness and facility as it was untied before they went to rest.

The callosities and tumours on their breast and legs, the bruises and wounds of the skin, the entire shedding their hair, the hunger, thirst, and leanness of these animals are not their only inconveniences; they are prepared for all these evils by one still greater, namely, castration. They leave but one male for eight or ten females, and all the camels of burden are commonly geldings; they are weaker without doubt than those which are not mutilated, but they are more tractable, and ready for employ at all times; while the others are not only ungovernable but even furious, in the rutting time, which remains forty days, and returns every spring; when, it is affirmed, they continually foam, and one or two red vesicles, as large as a hog's bladder, issue from their mouths. At this time they eat very little, attack and bite animals, and even their masters, to whom at other times they are very submissive.

The camel does not copulate like other quadrupeds, for the female sinks upon her knees and receives the male in the same situation as she rests, sleeps, or is loaded. This posture, to which they are easily accustomed, becomes natural to them, since they assume it at the time of their copulation. The female goes about twelve months with young, and, like all large quadrupeds, produces but one at a birth: they have great plenty of milk, which is thick and nourishing, even for the human species, when mixed with a great quantity of water. The females seldom do any labour when with young, but are suffered to bring forth at liberty. The advantages derived from their produce, and their milk, perhaps surpasses that which would be gained by their labour; nevertheless, in some places a great part of the females undergo castration, in order to render them more fit for labour; and it is pretended, that this operation, instead of diminishing augments their strength and vigour, and adds to the beauty of their appearance. In general the fatter camels are, the more capable they are of enduring great fatigue. Their hunches appear to be formed from the superabundance of nourishment, for in long journeys, where they are stinted in their food, and where they suffer both hunger and thirst, these hunches gradually diminish, and are reduced so flat that their places are only discovered by the length of the hair, which is always longer on these parts than on the rest of the back; the leanness of the body increases in proportion as the hunches diminish. The Moors, who transport all their merchandize from Barbary and from Numidia into Ethiopia, depart with their camels well loaded, who are then very fat and vigorous, but bring the same animals back so lean that they commonly sell them at a low price to the Arabs of the desart, who fatten them anew.

The ancients have affirmed that these animals are capable of generating at the age of three years: this appears to me rather doubtful, for at that age they have not attained half their growth. The genital member of the male, like that of the bull, is very long and slender; it tends forward during copulation, like that of every other animal; but in its usual state, it is bent backwards, and voids the urine between the legs, so that the male and female pass their urine in the same manner. The young camel sucks its mother twelve months, and when designed for labour, to make him strong and robust they leave him at liberty to suck or graze for a longer time, nor begin to load or put him to work till he has attained the age of four years. The camel commonly lives forty or fifty years, which term of life is proportioned to the time of its growth. It is without any foundation that some authors have advanced that he lives a hundred years.

By uniting under one point of view all the qualities of this animal, and all the advantages which are gained by him, he must be acknowledged to be the most useful of all the creatures under subordination to man. Gold and silk are not the true riches of the east, the camel is the treasure of Asia. He is of greater value than the elephant, as he does as much labour, and consumes not a twentieth part of the food. Besides the whole species is subjected to man, who propagates and multiplies it as much as he pleases. But it is not so with the elephants, whom they cannot multiply, can only subdue them individually, and that with great trouble and difficulty. The camel is not only of greater value than the elephant but perhaps not of less than the horse, the ass, and the ox, when all their advantages are united. He carries as much as two mules, and not only eats less, but feeds on herbs as coarse as the ass. The female furnishes milk longer than the cow; the flesh of young camels is as good and wholesome as veal; their hair is finer, and more sought after than the best wool. Even their excrements are useful, for sal ammoniac is made of their urine, and their dung, when dried and powdered, serves them for litter, as well as the horses, with whom they often travel in countries where neither straw nor hay is known. To conclude, they also make excellent fewel of this dung, which burns freely, gives a flame as clear, and almost as lively, as that of dry wood, and which is of great use in the deserts, where not a tree is to be seen, and where, from the deficiency of combustible matters, fire is almost as scarce as water.

THE BUFFALO, THE BONASUS, THE AUROCHS, THE BISON, AND THE ZEBU.

ALTHOUGH the Buffalo is now common in Greece, and tame in Italy, it was known by neither the ancient Greeks nor Romans; for he never had a name in the language of these people. The word *buffalo*, even indicates a foreign origin, not derived either from the Greek or Latin tongues. In effect, this animal is originally a native of the warmest climates of Africa and India, and was not transported and naturalized in Italy, till towards the seventh century. The moderns very improperly apply the name of *bubalus* to this animal, which, in Greek and Latin implies indeed, an African animal, but very different from the buffalo, as it is easy to demonstrate, by many passages of ancient authors. If we would ascribe the bubalus to any particular genus, it rather belongs to that of the antelope, than to that of the ox or the buffalo*. Belon having seen a small hunched ox at Cairo, which differed from the buffalo and common ox, imagined it might be the *bubalus* of the ancients; but if he had carefully compared the characters of the *bubalus* given by the ancients, with those of this small ox, he would have discovered his error; besides, we can speak of it with decision, for we have seen this small hunched ox alive, and having compared the description we have given of it with that of Belon, we can have no doubt of its being the same animal. It was shewn at the fair at Paris in 1752, under the name of the *zebu;* which we have adopted to describe this animal by, for it is a particular breed of the ox, and not a species of the buffalo or bubalus.

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* Upon the first publication of Buffon's Histoy, M. Caetani made some remarks upon the assertion that the buffalo had

Aristotle, speaking of oxen, only mentions the common ox, except saying, that among the Arachotas in India, there are wild oxen, which differ from the domestic ones as much as wild boars differ from hogs; but in another part, he gives the description of a wild ox of Pæonia, a pro-

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had no name in the Greek or Latin languages and with a great display of erudition, in a letter to Buffon, endeavoured to shew that there *were* words in both these languages which nearly approached to that of buffalo; but M. Buffon himself justly remarks that Caetane rather proves the possibility of deriving the name of buffalo from some words in the Greek and Latin languages than that this name was really in use among them.

a province adjoining to Macedonia, which he calls *bonasus*. Thus the common ox and the bonasus, are the only animals of this kind taken notice of by Aristotle; and what must appear singular, the bonasus, although fully described by this great philosopher, has not been recognised by any of the Greek or Latin naturalists who have written after him, all of whom have literally copied him on this subject; so that to this day, there is no more than the name of bonasus known, without the knowledge of the animal which it ought to be applied to. If we consider, that Aristotle, in speaking of the wild oxen of temperate climates, has only mentioned the bonasus; and that, on the contrary, the Greek and Latin authors of succeeding ages, have not spoken of the bonasus, but describe these wild oxen by the names of *urus* and *bison*, we shall be led to believe, that the bonasus must be either the one or the other of these animals; indeed by comparing what Aristotle has said of the bonasus, with what we know of the bison, it is more than probable, that these two names indicate the same animal. Julius Cæsar is the first who mentions the urus. Pliny and Pausanias are also the first who speak of the bison. Since Pliny's time, the name of *bubalus* has been given indiscriminately to the urus, or the bison, and this confusion has increased with time. To the bonasus, bubalus, urus, and bison, have been added, the *catopleba*, the *thur*, the *bubalus* of Belon, the bisons of Scotland and America, and all our naturalists have made as many different species as they have found names. The truth is here so obscured by clouds, and so surrounded with errors, that it will be difficult to clear up this part of Natural History, which the contradiction of reports, the variety of descriptions, the multiplicity of names, the diversity of places, the difference of languages, and the obscurity of the times, seems to have condemned to perpetual darkness.

I shall, therefore, give my opinion upon this subject, and afterwards present the proofs upon which it is founded.

1. The animal at present called *buffalo*, (*fig*. 137) was not known to the ancients.

2. The buffalo, at present domestic in Europe, is the same as the tame or wild buffalo of India and Africa.

3. The *bubalus* of the Greeks and Romans is neither the buffalo nor the small ox of Belon, but the animal that the gentlemen of the Academy of Sciences have described in treating of the *Barbary cow*, and which we call the *bubalus*.

4. The small ox of Belon which we have

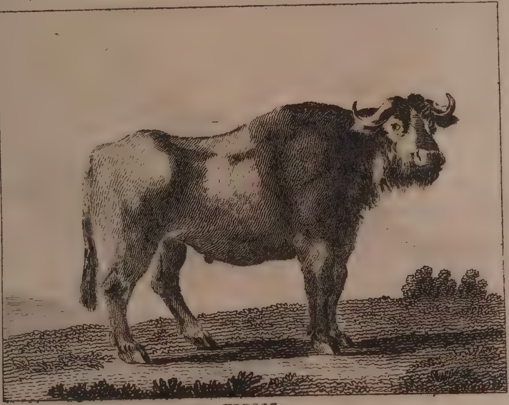

FIG.137

Buffalo

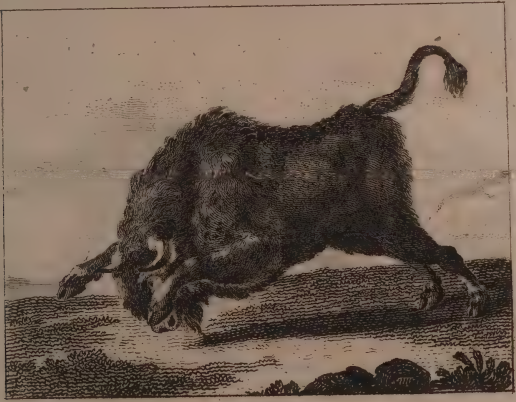

FIG.138

Bison

seen, and call by the name of *zebu*, is no more than a variety in the species of the ox.

5. The *bonasus* of Aristotle is the same animal as the bison (*fig.* 138) of the Latins.

6. The *bison* of America might originally come from the bison of Europe.

7. The *urus* or *aurochs*, is the same animal as our common bull, in his wild and natural state.

8. The bison only differs from the aurochs by accidental varieties, and consequently he is, as well as the aurochs, of the same species as the domestic ox; so that, it appears, all the denominations, and all the pretended species of the ancient and modern naturalists may be reduced to three; namely, the ox, the buffalo, and the bubalus.

I do not doubt that some of the propositions which I have laid down will appear mere bold assertions, particularly to those who are employed with the nomenclature of animals, or have endeavoured to give a catalogue of them; nevertheless, there is not one of these assertions which I am not able to prove. But before I enter into critical discussions, each of which demand particular propositions, I shall explain the observations and facts which conducted me into this enquiry, and which having satisfied me, may also prove satisfactory to others.

Domestic animals in very few respects resemble wild ones; their nature, their size, and their form, are less constant, and more subject to changes, especially in the exterior parts of the body. The influence of climate, so powerful over all Nature, acts with more force upon captive animals, than upon free. Food prepared by the hand of man, oftentimes scantily given and ill-chosen, joined to the inclemency of a foreign sky, in time produces alterations sufficiently deep to become constant, and to be perpetuated from one generation to another. I do not pretend to say, that this general cause of alteration is so powerful as to essentially alter the nature of beings, whose constitution is so fixed as that of animals; but it changes them in certain respects; it disguises and transforms them externally; it takes away from some parts, and gives rise to others; it paints them with various colours, and by its action upon the habit of the body, it has an influence on their dispositions, instincts, and most interior qualities. A single part changed in a composition so perfect as that of an animal body, is sufficient to make the whole sensible of the alteration; and it is for this reason, that our domestic animals differ almost as much in dispositions and instincts as in figure from those who continue at large in their natural state. Of this, the sheep furnishes a striking example; this species, such as it is at present, perishes in a very short time, if man ceases from tending it with care: it is also greatly changed, and very inferior to its original species. But to adhere to our present subject; we see what changes the ox has gone through, from the combined effects of climate, nourishment, and treatment, in a wild, and in a domestic state.

The most general, and most remarkable variety in domestic and even wild oxen, consists in that sort of hunch which some have between the shoulders: this race of oxen are called *bisons*, and it has been hitherto believed, that they were of a different species from the common ox; but as we are assured, that they produce together, and that the hunch diminishes in the first generation, and disappears in the second or third, it is evident, that this hunch is only a variable and accidental character, which does not prevent the bison from belonging to the same species with the common ox. There were formerly in the desart parts of Europe, wild oxen, some without hunches, and others with them; thus the variety seems to be natural, and to proceed from the abundance and more substantial quality of food; for we remarked, when treating of the camels, that when those animals are lean, and badly fed, they have not even the appearance of a hunch. The ox without a hunch was named *vrochs*, and *turochs*, in the German tongue; and the ox with a hunch, in the same language, was termed *visen*. The Romans, who knew neither of these wild oxen before they saw them in Germany, adopted those names; of *vrochs* they made *vrus;* and of *visen*, *bison;* and they never imagined that the wild ox described by Aristotle, under the name of *bonasus*, could possibly be either of these oxen, whose names they had thus latinised.

Another difference between the aurochs and the bison is the length of the hair; the neck, shoulders, and throat of the bison are covered with very long hairs; while the aurochs have all these parts covered with a short hair, resembling that of the rest of the body, the front excepted, which has frizzled hair. But this difference of the hair is still more accidental than that of the hunch, and, like that, depends on the food and climate, as we have already proved in the goats, sheep, dogs, cats, &c. Thus, neither the hunch, nor the difference in the quantity of hair, are specific characters, but merely simple and accidental variations.

A variety still more extended, and to which naturalists have given more of character than it really deserves, is the form of the horns; they have not considered that, in our domestic cattle, the shape, size, position, direction, and even number of horns, vary so strongly, that it would be impossible to pronounce which is the true model of Nature. The horns of some cows are curved and bent downwards; others have them straight, long, and elevated. There are whole races of sheep, who have sometimes two, sometimes four horns, and there are breeds of cows who have no horns. These exterior, or, as I may say, accessory parts of the body, have as little permanency as the colours of the hair, which in domestic animals vary and combine in every manner. This difference in the shape and direction of the horns, which is so common, must not then be regarded as a distinctive character of the species; though, it is upon this character alone that our naturalists have established their species; and, as Aristotle, in the description he gives of the bonasus, says, that its horns turn inwards, they have from that alone separated it from all other oxen, and made it a particular species,

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without having ever seen the individual. Upon this variation of the horns, in domestic animals, we have quoted cows and ewes, rather than bulls and rams, because the females are more numerous than the males, and we may every where observe thirty cows or ewes for one bull or ram.

The mutilation of animals by castration seems to hurt the individual only, and not to affect the species; nevertheless, it is certain, that this custom restrains Nature on one side and weakens it on the other. A single male, condemned to serve thirty or forty females, must exhaust himself without satisfying them. The ardour of love must be unequal; indifferent in the male, who exceeds the designs of Nature, and too ardent in the female, who must be so limited; from thence all the productions must chiefly be tinctured with feminine qualities, a greater number of females will be produced than males; and even the males possess more of the mother than the father. This is, without doubt, the reason there are more girls than boys born in the countries where men have a great number of wives, while among those where the men are permitted to have but one, more males than females are born. It is true, that among domestic animals they commonly withhold the most beautiful from castration, to become the parent of a numerous generation. The first productions of these chosen males will be strong and vigorous; but from having too many copies from this single mould the impression of Nature is deformed, or at least impaired, and not preserved in its full perfection; the race must, therefore, be weakened and degenerate; and this, perhaps, is the cause why more monsters are to be found among domestic than wild animals, where the number of males, which concur to generation, is equal to that of the females. Moreover, when there is but one male to a great number of females they have not the liberty of consulting their own taste, and, consequently, deprived of those emotions which arise from spontaneous pleasures. In the females there remains nothing poignant in their amours, and they languish in expecting the cold approaches of a male that is not of their own choice, who is frequently not accommodated to them, and from whom they do not receive those flattering caresses as if he were obliged to court a preference. From these sluggish amours insipid beings must proceed, who will have neither that courage, spirit, nor strength, which Nature only can bestow on every species by leaving to individuals their faculties quite entire, especially the liberty of choice between the sexes. It is well known, in the example of horses, that the cross breed is always the finest; we ought not, therefore, to confine our female cattle to a single male of their own country, who already has too much the resemblance of his mother, and who, consequently, far from improving the species, can only continue to degrade it. Mankind, in this practice, have preferred their convenience to every other advantage; they have not endeavoured to support, or to embellish Nature, but submit her operations to them, that they may enjoy her productions in a more despotic manner. The males are the superior of each species; they have the most spirit, and are the least tractable; a greater number of males in our flocks therefore would render them less docile, more difficult to conduct and to watch.

To these causes of degeneration in domestic animals we must yet mention another, which alone is capable of producing more changes than all the rest put together, viz. the transportation of animals from one climate to another; oxen, sheep, and goats, have been carried to all parts; in every place they have felt the influence of the climate, and imbibed impressions from every soil and every sky, so that nothing is more difficult than to recognize, in this great number of varieties, those who are the least estranged from the type of Nature.

Having thus explained the general causes of varieties among domestic animals, I shall proceed to the particular proofs of what I have advanced on the subject of oxen and buffaloes. I have said, 1st. *That the animal at present known by the name of the buffalo was not known by the ancient Greeks, and Romans.* This is evident, since none of their authors have described, or even used, a name which can be applied to it; besides, we are informed, by the annals of Italy, that the first buffalo was brought there towards the end of the fifth century, A. D. 595.

2. *The Buffalo, at present domestic in Europe, is the same as the wild or tame buffalo of India and Africa.* This needs no other proof, than the comparison of our description of the buffalo, taken from an animal we saw alive, with the remarks that travellers have given of the buffaloes of Persia, Mogul, Bengal, Egypt, Guinea, and the Cape of Good Hope. In all these countries this animal is the same, and does not differ from our buffalo but in very slight differences.

3. *The Bubalus of the Greeks and Romans, is not the buffalo, nor the small ox of Belon; but the animal that the gentlemen of the Academy has described under the name of the cow of Barbary.* This appears clear from Aristotle placing the bubalus with the stags and fallow deer, and not with the oxen. In other parts, he speaks of him among the roebucks, and says, that he but badly defends himself with his horns, and that he flies from ferocious animals. Pliny, in speaking of the wild oxen of Germany, says, that it is through ignorance that the common people give the name of bubalus to these oxen, for the bubalus is an animal of Africa, which in some measure resembles a calf or a stag. The bubalus is then a timid animal, who has no other resource than by flight to avoid the attack of ferocious animals, who consequently from this circumstance must be swift, and possess something of a make between the calf and a stag: all these characters, not one of which apply to the buffalo, are found perfectly united in the figure of the animal which *Horatius Fontana* sent to Aldrovandus, and of which the gentlemen of the Academy have given a figure and description under the name of the *cow of Barbary;*

Barbary; and they have thought, with me, that it was the bubalus of the ancients.*

4. *The small ox of Belon is only a variety in the species of the ox.* We shall easily prove this, by only referring to the figure of the animal given by Belon, Prosper Alpinus, Edwards, and to the description we have made. We have seen it alive; his conductor told us, that he brought him from Africa, where he was called *Zebu;* that he was domestic; and that they used him to ride on. This animal is, in fact, very gentle and familiar; he is of an agreeable figure, though heavy and thick; nevertheless he so perfectly resembles the ox, that I cannot give a more just idea of him, than by saying, if we were to look at a very handsome bull, through a glass that diminishes objects one half, the figure would very near approach that of the zebu.

5. *The Bonasus of Aristotle is the same as the bison of the Latins.* This proposition cannot be proved, without a critical discussion, with the whole detail of which I shall not trouble the reader. Gesner, who was a learned man, as well as a naturalist, and who thought

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* The zebu, or small ox of Belon, has none of the characters of the bubalus; it differs from it almost as much as our ox differs from the antelope: Belon also is the only naturalist who has considered this small ox to be the bubalus of the ancients.

thought with me, that the bonasus might be the bison, has more carefully than any other person examined and discussed the observations which Aristotle gives on the bonasus, and at the same time has corrected many erroneous expressions in the translation of Theodore Gaza, which nevertheless all the naturalists have followed without examination: in adopting, therefore, his elucidations, and in suppressing from the remarks of Aristotle, whatever is obscure, contradictory or fabulous, they appear to me reduced to the following description:

The bonasus is a wild ox of Pœonia, and is at least as big as a domestic ox, and of the same make; he is covered from the shoulders to the eyes with a long hair, like the mane of a horse; his voice is like the ox; his horns are short, and curved round the ears; his legs are covered with long hair, soft as wool, and his tail is small compared to his size, although in other respects it resembles that of the ox. Like the bull, he has the custom of pawing the ground with his feet; his hide is hard, his flesh is tender, and good. By these characters, which are all we can rely on from Aristotle, we see how near the bonasus approaches towards the bison. Every part, in fact, agrees, the shape of the horns excepted, but which, as we have already observed, greatly varies in animals, who are, notwithstanding, of the same species. We have seen such crooked horns, taken from an hunched ox of Africa, and we shall hereafter prove, that this hunched ox is no other than the bison. This we shall be able to confirm by the testimonies of ancient authors. Aristotle mentions the bonasus as an ox of Pœonia; and Pausanias, speaking of the Pœonian bulls, says, in two different parts of his works, that these bulls are bisons; he even expressly says, that the bulls of Pœonia, which he saw at the public games at Rome, had very long hair upon the breast, and about the jaws. In short, Julius Cæsar, Pliny, Pausanias, Solinus, &c. in speaking of wild oxen, mention the aurochs and the bison, but take no notice of the bonasus. It must, therefore, be supposed, that in less than four or five centuries the species of the bonasus has been lost, unless we allow that the names *bonasus* and *bison* indicate only the same animal.

6. *The bison of America might come originally from the bison of Europe.* We have already laid down the foundation of this opinion in our discourse on the animals of the two continents; they are the result of the experience of M. de la Nux, who has given much information on this subject. He has informed us, that the bisons, or hunched oxen,

of India and Africa, copulate with the bulls and cows of Europe, and that the hunch is only an accidental character, which diminishes in the first generation, and disappears in the second or third. Since the bisons of India are of the same species as our oxen, and have, consequently the same origin, is it not natural to extend this organ to the bison of America? Every thing seems to concur in support of this supposition. The bisons appear to be originally of cold and temperate regions; their name is derived from the German language; the ancients say that they were found in that part of Germany which borders on Scythia; and there are now bisons in the north of Germany, in Poland, and in Scotland; they might, therefore, have passed into America, or even have come from thence, as they are animals common to the two continents. The only difference between the bisons of Europe and those of America is, that the latter are less. But even this difference is a new presumption that they are of the same species, for we have already remarked, that generally both domestic and wild animals, which have passed of themselves, or have been transported, into America, have, without any exception, diminished in size; besides, all the characters, even the hunch, and the long hairs at the hinder parts, are the same in the bisons of America and in those of Europe; thus we cannot refuse to regard them, not only as animals of the same species but also of the same race.

7. *The urus, or aurochs, is the same animal as the common bull, in his wild and natural state.* This position is clear, as the figure and constitution of the body of the aurochs is perfectly similar to that of our domestic bull. The aurochs is only larger and stronger, like every other animal who enjoys his liberty. The aurochs are still to be met with in some provinces of the north. The young aurochs have been taken from their mothers, and being reared, when of a proper age have copulated with the domestic bulls and cows, so that we cannot doubt but they are of the same species.

8. *To conclude, the bison differs from the aurochs by accidental varieties only, and, consequently, is also of the same species as the domestic ox.* The hunch, the length and quality of the hair, and the form of the horns, are the sole characters by which we can distinguish the bisons from the aurochs. But we have known the hunched oxen produce with the domestic kind; we likewise know, that the length and quality of the hair, in all animals, depend on the nature of the climate; and we

have remarked, that in oxen, goats, and sheep, the form of the horns frequently varies. These differences, therefore, are not sufficient to establish two distinct species; and since our domestic oxen produce with the hunched oxen of India, we have reason to think they would copulate with the bison, or hunched ox of Europe. There are, in the almost innumerable varieties of these animals, in different climates, two primitive kinds, both of which have long continued in a natural state; the hunched ox, or bison, and the aurochs, or ox without an hunch. These kinds have subsisted till this present time, either in a wild or domestic state, and are scattered, or rather have been transported, into all the climates of the earth. All the domestic oxen without hunches have proceeded originally from the aurochs, and those with the hunch from the bison. To give a just idea of these varieties we shall make an enumeration of them as they are found in the different parts of the world.

To begin with the north of Europe; the few oxen and cows of Iceland are deprived of horns, although they are of the same kind as our oxen. The size of these animals is rather relative to the plenty and quality of pasture than to the nature of the climate. The Dutch fetch lean cows from Denmark, which fatten prodigiously in their rich meadows, and give a great deal of milk: these Denmark cows are larger than ours. The bulls and cows of the Ukraine, where there is excellent pasture, are said to be the biggest in Europe, and they are of the same kind as our oxen. In Switzerland, where the tops of the mountains are covered with an abundant and flourishing verdure, and which is solely reserved as food for the cattle, the oxen are nearly double the size of those in France, where commonly they are fed on the coarsest herbage, which is refused by horses. Bad hay, and leaves, are the common food of our oxen in winter, and in spring, when they should be refreshed, they are excluded from the meadows; they, therefore, suffer still more in that season than in winter, for they then have little or nothing given them in the stable, but are driven into the roads, into fallow fields, or into the woods, and are always kept at a distance from the fertile lands, so that they are more fatigued than fed; at last, in summer, they are permitted to enter the meadows, which are then stripped, and parched with heat and drought; there is not, therefore, a single season throughout the year in which these animals are amply or agreeably fed. This is the sole cause which renders them weak, poor, and small; for, in Spain, and in some cantons of the provinces of France, where there is good pasture, and solely reserved for the oxen, they are much stronger and larger.

In Barbary, and most part of Africa, where the ground is dry, and the pasture poor, the oxen are still smaller, the cows give much less milk than those in France, and the greatest part of them lose their milk when their calves are taken from them. They are the same in some parts of Persia, of Lower Ethiopia, and in Great Tartary, while in the same countries, and at very small distances, as in Calmuck Tartary, in Upper Ethiopia, and in Abyssinia, the oxen are a prodigious size. This difference, therefore, depends more on the plenty of their food than on the temperature of the climate. In the northern, temperate, and warm regions, we equally find, at very small distances, small or large oxen, according to the quantity and quality of the pasture, they are fed upon.

The breed of aurochs, or ox without a hunch, inhabits the cold and temperate zones, and is not much dispersed in the southern countries. On the contrary the breed of the bison, or hunched ox, occupies all the southern provinces. In the whole continent of India, in the eastern and southern islands of all Africa, from Mount Atlas to the Cape of Good Hope, we find no others but hunched oxen; it even appears, that this breed, which has prevailed in all the warm countries, has many advantages over the others; for, like the bison, of which they are the issue, their hair is softer, and more glossy than our oxen, who, like the auroch, are furnished but with little hair, of a harsh nature. These hunched oxen are also swifter, and more proper to supply the place of the horse*; at the same time they are less clumsy, stupid, and indolent than our oxen. They are more tractable, and sensible, have more of that intelligence which renders them useful; they are also treated with more care than our finest horses. The regard the Indians have for these animals is so great that it has degenerated into superstition, the last mark of blind respect. The ox, as the most useful animal, has appeared to them the most worthy of being revered; and they have made an idol of the object of their veneration, a kind of beneficent and powerful divinity; for we are

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* At Surat, Persia, and in all the provinces of India, they are used for carrying burdens and drawing a kind of coaches, and by constant habit they acquire such a dexterity that few animals can outrun them. *See Voyages della Valle, Owington, Mandelslo, Flacourt, Grosse, &c.*

are desirous of rendering all we respect, great, and capable of doing much good, or much harm.

These hunched oxen vary perhaps more than ours in the colours of the hair, and the figure of their horns, the handsomest are all white, like the oxen of Lombardy. Some are destitute of horns, while others have them very much elevated, and others so bent down, that they are almost pendent. It even appears, that we must divide this first race of bisons, or hunched oxen, into two secondary kinds; the one large, and the other small, and this last is that of the *zebu*. Both of them are found nearly in the same climates, and are equally mild and easily managed; both have soft hair, and a hunch upon the back; this hunch is nothing but an excrescence, a kind of wen, a piece of tender flesh, as good to eat as the tongue of an ox. The hunches of some oxen weigh from forty to fifty pounds, others have them much smaller. Some of these oxen have prodigious large horns; there is one in the French king's cabinet, which is three feet and a half in length, and seven inches in diameter at the base; many travellers affirm that they have seen them, of a capacity sufficient to contain fifteen, and even twenty pints of water.

The method of castrating large cattle is not known in any part of Africa, and it is but little practised in India. When the bulls undergo this operation, it is not by cutting, but compressing their testicles; and although the Indians keep a number of these animals to draw their carriages, and work in their grounds, they do not by any means train up so many as we do. As in all hot countries the cows give but little milk; as the natives are but little acquainted with cheese and butter; and as the flesh of the calves is not so good as in Europe, they multiply the horned beasts less than we do. Besides, all those southern provinces of Africa and Asia, being much less peopled than Europe, there are a great number of wild oxen, who are taken when young; these become tame of themselves, and submit to labour without any resistance; they become so tractable, that they are managed with greater ease than horses, the voice of their master is only requisite to direct and make them obey; they are very careful of them in every respect, and give them plenty of the best food. These animals, thus raised, appear to be of a different nature from our oxen, who only know us by our bad treatment; the goad, whip, and scarcity of food, render them stupid and weak: in short, if we knew our own interest, we should treat what is dependent on us with better usage. Men of inferior rank, and people the least polished, seem to have a better sense than others of the laws of equality, and the shades of natural equality. The servant of the farmer may be said to be upon a level with his master; the horses of the Arabs, and the oxen of the Hottentots, are favourite domestics, companions in their exercises, assistants in their labour, and with whom they share their habitation, their bed, and their tables. Man, by this community, debases himself less than the beasts are elevated and humanized. They become affectionate, sensible, and intelligent; they there perform, through love, all that they do here through fear. They do more; for as their nature is raised by the gentleness of their education, and by the continuance of attention towards them, they become capable of actions almost human. The Hottentots bring up their oxen to war, and make use of them nearly in the same manner as the Indians do of the elephants; they instruct these oxen to guard their sheep, to conduct them from place to place, and to defend them from strangers and ferocious beasts; they teach them to know friends from enemies, to understand signs, and to obey the voice. Thus the most stupid of men are the best preceptors of beasts.

All the southern parts of Africa and Asia are then inhabited with bisons, or hunched oxen, among which is a great variety in respect to size, colour, shape of the horns, &c. On the contrary, all the northern countries of these two parts of the world, and the whole of Europe, comprehending the adjacent island, as far as the Azores, have only oxen without hunches, who derive their origin from the aurochs; and as the aurochs, which is our ox in a wild state, is larger and stronger than our domestic ones, so the bison, or wild hunched ox, is also stronger and larger than the tame ox of India. He is also sometimes smaller, but that depends only on the quantity of food. At Malabar, in Abyssinia, and Madagascar, where the meadows are naturally spacious and fertile, the bisons are of a prodigious size; in Africa and Arabia Petrea, where the land is dry, the zebus, or bisons, are of a small size.

In every part of America oxen without hunches are generally diffused, which the Spaniards and other Europeans have successively transported thither; these oxen have considerably multiplied, but are become less in these new countries. The species was absolutely unknown in South America; but in all the northern parts, as far as Florida, Louisiana, and even nearly to Mexico, the bisons, or hunched oxen, were found in great numbers. These bisons, which formerly inhabited the woods of Germany, Scotland, and other northern countries, have probably passed from one continent to the other, and are become, like other animals, smaller in this new world; and as they lived in climates more or less cold, their hair became longer or shorter. Their beards and hair is longer at Hudson's Bay than at Mexico, and in general their hair is softer than the finest wool. We cannot, therefore, avoid believing these bisons of the new continent are of the same species as those of the old; they have preserved all the principal characters, as the hunch upon the shoulders, the long hair under the muzzle, and on the hinder parts of the body, and the short legs and tail; and by comparing what Hernandes, Fernandes, and every other historian and traveller of the new world have said, with what has been written concerning the bison of Europe, we shall be convinced, that these animals are not of a different species.

Thus the wild and domestic ox, the ox of Europe, Asia, America, and Africa; the bonasus,

sus, the aurochs, the bison, and the zebu, are all animals of the same species, which according to the differences of climate, food, and treatment, have undergone all the variations we have explained. The ox is the most useful animal, and also the most universally dispersed; for, excepting South America, he has been found in all parts; his constitution being equally formed to withstand the ardour of the south, or rigours of the north. He appears to be ancient in every climate; he is domestic in civilized nations, and wild in desart countries or among unpolished people. He supports himself by his own resources when in a state of nature, and never loses the qualities relative to the service of man. The young wild calves, which are taken from their mothers in India or Africa, become in a very short time, as tractable as those of the domestic kind; and this natural conformity is another striking proof of the identity of the species. The gentleness of character in these animals indicates the natural flexibility of their bodies; for in all species in which we have discovered the character of gentleness, and which have been subjected to a domestic state, there are more varieties than can be found in those which have remained wild through their character of inflexibility.

If it be asked, whether the aurochs or the bison be the primitive race of oxen, a satisfactory answer may be drawn from the facts we have just laid down. The hunch of the bison is, as it has been observed, no more than an accidental character, which is defaced and lost in the mixture of the two kinds. The aurochs, or ox without a hunch, is, then, the most powerful and predominant kind; if it were otherwise, the hunch, instead of disappearing, would extend and remain upon every one of this mixt breed. Besides, this hunch of the bison, like that of the camel, is less the production of Nature than the effect of labour, and the mark of slavery. From time immemorial, in almost every quarter of the globe, the ox has been obliged to carry burdens; the habitual, and often excessive load, has deformed their backs; and this deformity has been afterwards propagated through generations. Undeformed oxen are no longer to be seen, but in those countries where they have not made use of them as beasts of burden. In all Africa, and in the eastern continent, the oxen are hunched, occasioned by their having always carried loads on their shoulders. In Europe, where they are only employed for draught, they have not undergone this deformed alteration, which in the first place probably proceeds from the compression of the loads, and in the second from the abundance of food; for it disappears when the animal is lean and poorly fed. Some enslaved and hunched oxen might have escaped or been abandoned in the woods, and where their posterity would be loaded with the same deformity, which, far from disappearing, may have encreased by the abundance of food peculiar to uncultivated countries, so that this second breed would spread over all the desart lands of the north and south, and pass into the New Continent, like other animals, whose nature can support the cold. What still more confirms the identity of the species of the bison and aurochs, is, the bisons of North America have so strong a smell, that they have been called *Musk Oxen* by most travellers; and, at the same time, we find, by the accounts of many persons, that the aurochs, or wild ox of Prussia and Livonia, has the same scent of musk.

There remains, therefore, but two species, the buffalo and the ox, out of all the names placed at the head of this article, each of which the ancient and modern naturalists have treated as separate and distinct. These two animals, although greatly resembling each other, both domestic, often living under the same roof, and fed in the same meadows, have nevertheless constantly refused to unite though excited to it by their keepers. Their natures are more distant than that of the ass and the horse; there even appears to be a strong antipathy between them, for it is affirmed, that cows will not suckle young buffaloes, and the female buffaloes refuse the same kindness to the other calves. The buffalo is of a more obstinate nature, and less tractable than the ox. He obeys with great reluctance, and his temper is more coarse and brutal. Next to the hog, he is the filthiest of all domestic animals, and is very unwilling to be cleaned and dressed. His figure is very clumsy, and forbidding; his look stupidly wild; he stretches out his neck in an ignoble manner, and carries his head in a very bad posture, almost always inclined towards the ground. He bellows hideously, with a tone much stronger and deeper than that of the bull. His legs are thin, his tail bare, his physiognomy dark, and his skin as black as his hair. He differs chiefly from the ox by the colour of his hide, which is easily perceived under his spare covering of hair. His body is thicker and shorter than that of the ox; his legs are longer; his head proportionally much less; his horns are not so round, black, and partly compressed, and he has a tuft of frizzled hair over his forehead. His hide is likewise thicker and harder than that of the ox. His flesh is black, and hard, and not only disagreeable to the taste, but repugnant to the smell. The milk of the female is not so good as that of the cow, but she yields a greater quantity. In hot countries, almost all the cheese is made of buffalo's milk. The flesh of the young buffaloes, though killed during the sucking time, is not a bit better. The hide alone is of more value than all the rest of the animal, whose tongue is the only part that is fit to eat: this hide is firm, pretty light, and almost impenetrable. As these animals are larger and stronger than oxen they are very serviceable; they make them draw, and not carry burdens; they lead them by the means of a ring passed through their nose. Two buffaloes harnessed, or rather chained, to a carriage, will draw as much as four strong horses. As they carry their necks and heads low, they employ the whole weight of their body in drawing, and their mass greatly surpasses that of a labouring horse, or ox.

The height and thickness of the buffalo alone indicates, that he is a native of warm countries. The largest quadrupeds belong to the torrid zone of the Old Continent; and the buffalo, for his magnitude, ought to be placed next to the elephant, the rhinoceros, and the hippopotamus. The camel is taller but less thick, and also a native of the southern countries of Africa and Asia. Nevertheless, buffaloes live and multiply in Italy, in France, and in other temperate provinces. Those kept in the royal menagerie, have brought forth two or three times; the female has but one at a birth, and goes with young about twelve months, which is another proof of the difference between this species and that of the cow, who only goes nine months. It appears also, that these animals are more gentle and less brutal in their native country, and the warmer the climate the more tractable is their nature. In Egypt they are more tractable than in Italy; and in India more so than in Egypt. Those of Italy have also more hair than those of Egypt, and those of Egypt more than those of India. Their coat is never entirely covered, because they are natives of hot countries; and in general, large animals of these climates have little or no hair.

There are a great number of wild buffaloes in the countries of Africa and India, which are watered by large rivers, and where extensive pasturages are found. The wild buffaloes go in droves and make great havock in cultivated lands, but they never attack the human species, unless they are wounded, and are then very dangerous; for they make directly at their enemy, throw him down, and trample him under their feet. They are, however, greatly terrified at the sight of fire, and are displeased at a red colour. Aldrovandus, Kolbe, and many other naturalists and travellers, assure us, that no person dare wear red cloaths in the country where the buffaloes are.* I know not whether this aversion to fire and a red colour be general among the buffaloes; for there are but few among our oxen who grow angry at the sight of red cloaths.

The buffalo, like all large animals of warm climates, is fond of bathing, and even of remaining in the water; he swims well, and boldly traverses the most rapid floods. As his legs are longer than those of the ox, he runs also quicker. The Negroes of Guinea, and the Indians of Malabar, where the buffaloes are very numerous, often hunt them. They neither pursue nor attack them openly, but climbing up the trees, or hiding themselves in the thickets, which the buffaloes cannot penetrate, on account of their horns, they wait for and kill them. Those people are fond of the flesh of the buffalo, and gain great profit by vending their hides and horns, which are harder and better than those of the ox.

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* Sonnini says, that he did not perceive the buffaloes of Egypt to be affected in this manner by a red colour, for all the inhabitants of this country wear round their neck and breast a *chall* of the same colour, without the buffaloes appearing to be affected or irritated.

The animal, called, at Congo, *Empacassa* or *Pacassa*, though very badly described by travellers, seems to me to be the buffalo; and that which they have spoken of, under the name of *Empabunga*, or *Impalunca*, in the same country, may possibly be the bubalus, whose history we shall give with that of the antelope.

SUPPLEMENT.

M. DE QUERHOENT says, that altho' the bisons invariably differ from the common oxen by the hunch on their backs, and their hair being longer, yet they breed in the Isle of France, and their flesh is preferable to that of European oxen; their hair is also smoother, their legs thinner, and their horns are longer, and after some few generations the hunch entirely disappears. There was one brought to Holland from North America, which was carried about to different towns, by a Swede, in a large cage; this one had an enormous mane round his head, which was not hair, but a very fine wool, divided into locks like a fleece; the skin was of a black colour, excepting on the hunch, where the hair was longer, and under that the skin was rather tawny; and to us this animal seemed to differ from the European by the hunch and wool only.

Bisons are said to have existed formerly in the north of Europe, and Gesner asserts, that even in his time there were some in Scotland; but I have been credibly informed by letters, both from England and Scotland, that not the smallest remembrance of them can be traced in that country. Mr. Bell, in his travels from Russia to China, mentions seeing two species of oxen in the northern parts of Asia, one of which was the aurochs, and the other what we, after Gmelin, have called the Tartarian, or Grunting Cow, which seemed to be of the same species as the bison; and in which we find, by comparison, a perfect coincidence of characters, excepting that the former grunts and the latter bellows.

Although the race of the bisons appear diffused in the Old Continent, from Madagascar and the point of Africa, and from the extent of the East Indies even to Siberia, and that though they are met with in the new continent, from the country of the Ilionois to Louisiana and Mexico, they have never passed the isthmus of Panama, for there are not any bisons in South America, notwithstanding the climate is perfectly agreeable to their nature, and European oxen multiply there as well as in any other place.

The best bulls and cows at Madagascar were brought from Africa, and have a hunch on their backs; but the cows give very little milk. In this island there are wild bisons in the forests, the flesh of which is not so good as that of our oxen. The natives of Agra hunt them on the mountain of Nerwer, in the road from Surat to Golconda, and which is surrounded with wood.

The zebu, as we formerly observed, is the bison as well as the ox in miniature, and though originally a native of warm regions, can nevertheless exist and multiply in temperate ones, for in a letter I received from Mr. Colinson, dated London, December, 1764, he assures me, that the Dukes of Richmond and Portland had several of these animals in their parks, and which brought forth calves every year: they were originally brought from the

East Indies. He adds, that the females were much larger than the males, but that the hunch on the back was twice as big on the latter as the former; that the young zebu sucks the mother like other calves, but that in our climate the milk soon dries up, and that it is necessary to have another female to bring them up; that the Duke of Richmond ordered one of them to be killed, when its flesh was found not to be near so good as that of the common ox.

There may also be small oxen without the hunch, which, like the zebu, constitute a particular race; for Careri, in his journey from Ispahan to Schiras, saw two small cows, which had been sent as a present to the king, that did not exceed the size of calves; they were fed entirely upon straw, and yet were very fat.

As to the buffaloes, although they can make but little use of their horns, they are compelled to fight lions and tigers in the Mogul's country. These animals are numerous in warm and marshy countries, especially near rivers, for water and a moist soil seems to be more necessary to them than a warm climate; there are not any of them therefore in Arabia, where the country is dry. They hunt the wild buffaloes, but with great caution, as they are very dangerous, and when wounded rush at their opponents with great fury.

M. de Querhoënt says, the body of the buffalo, at the Cape of Good Hope, is about the size of our oxen, but his head is larger, and his legs shorter. They generally keep about the edge of the woods; and as he has a bad sight he keeps his head near the ground, and when he observe any disagreeable object near him he makes a sudden dart upon it, making at the same time a most hideous bellowing, and on those occasions it is difficult to escape him; but he is not so much to be feared in the open fields: his hair is commonly red, with a few black spots, and they are often seen together in large flocks.

THE ZEBU.

WE have already spoken of this little ox under the article buffalo; but as there has been one brought to the royal menagerie since the impression of that article, we can now speak of it with greater exactness, and give an engraving of it done from life. I have also learned, by making new researches, that this small ox, to which I have given the name of *zebu*, (*fig.* 145.) is very probably the same animal which is called *lant*, or *dant*, in Numidia, and in some other northern provinces of Africa, where it is very common, and that the name *dant*, which can belong to no other animal but this we are treating of, has been transported from Africa into America, and given to an animal which only resembles this by the size of his body, and who belongs to a different species. This dant of America is the tapir, or the maipouri; and in order that it may not be confounded with the dant of Africa, which is our zebu, we shall give the history of it in this volume.

THE MUFLON, AND OTHER SHEEP.

THE weakest species of useful animals were rendered domestic the earliest of any. The sheep and goat were subjugated before the horse, the ox, or the camel. They were also transported from one climate to another with greater ease; hence the great variety which are to be met with in these species, and the difficulty of recognizing the original breed of each. It is certain, as we have proved, that our domestic sheep, as they at present exist, could not support themselves without the assistance of man; it is, therefore, evident that Nature did not produce them as they at present are, but that they have degenerated under our care; consequently we must search among the wild animals for those which come the nearest to the sheep; we must compare them with the domestic sheep of foreign countries, examine the different causes of the alteration, change, and degeneration, which has had such influence upon the species, and endeavour to restore all these various and pretended species to a primitive race, as we have done in that of the ox.

The sheep, with which we are acquainted, is only to be met with in Europe, and some of the temperate provinces of Asia; if transported into Guinea, it loses its wool, and is covered with hair, it decreases in fertility, and its flesh has no longer the same taste. It cannot subsist in very cold countries, though a breed of sheep is to be found in cold climates, especially in Iceland, who have many horns, short tails, and harsh thick wool, under which, as in almost every animal in the north is a second lining, of a softer, finer, and thicker wool. In warm countries, on the contrary, the sheep have generally short horns and a long tail, some of which are covered with wool, others with hair, and a third kind with a mixture of wool and hair. The first of these sheep of a warm country is that commonly called *Barbary sheep*, or the *Arabian sheep*, which resembles the domestic kind, excepting the tail which is so loaded with fat, as to be often more than a foot broad, and weighs upwards of twenty pounds. This sheep has nothing remarkable but his tail which he carries as if a pillow was fastened to his hinder parts. Among this kind of sheep, there are some whose tails are so long and heavy, that the shepherds are obliged to fasten small boards with wheels to them, to enable the animal to walk along. In the Levant, these sheep are cloathed with a very fine wool, while in warm countries, as Madagascar, and the Indies, they are covered with hair. The superabundance of fat, which in our sheep fixes about the kidneys, in these animals descends upon the vertebræ of the tail; the other parts of their body are less charged with it than our fed sheep. This variety is to be attributed to the climate, the food, and the care of men; for these broad, or long-tailed sheep, are domestic like ours, and even demand more care and management. This breed is much more dispersed than the common kind. They are common in Tartary, Persia, Syria, Egypt, Barbary, Ethiopia, Madagascar, and even as far as the Cape of Good Hope.

In the islands of the Archipelago, and chiefly in the island of Candia, there is a breed of domestic sheep, of which Belon has given the figure and description under the name of *strepsicheros*: this sheep is of the make and size of our common kind; it is like that covered with wool, and only differs from it by the horns, which are erect, and in form of a screw.*

In short, in the warmest countries of Africa and India, there is a breed of large sheep with rough hair, short horns, hanging ears, and a kind of dewlap under the neck. This sheep, Leo Africanus, and Marmol call *adimain*, and it is known to the naturalists by the names of the *Senegal ram*, the *Guinea ram*, the *Angola sheep*, *&c.* He is domestic, like ours, and like him, subject to varieties. The sheep, though they differ in particular characters, resemble each other so much in other respects that we cannot doubt they are of the same kind. Of all domestic sheep, this appears to approach nearest to a state of nature; he is larger, stronger, quicker, and consequently more capable of supporting himself; but as he is only found in the hottest countries, and cannot bear cold, and as he does not exist in his own climate in a wild state, but is domestic and obliged to the care of man for his support we cannot regard him as the primitive breed, from which all the rest have derived their origin.

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* Sonnini observes that this race is also very common in Hungary and Austria where it is called *zackl.*

In considering domestic sheep, therefore, according to the difference of climate, we find, 1. The sheep of the north, who have many horns, and whose wool is coarse. The sheep of Iceland, Gothland, Muscovy, and other parts of the north of Europe, have all coarse hair, and appear to be of the same breed.

2. Our sheep whose wool is very good and fine in the mild climates of Spain and Persia, but in hot countries changes to a rough hair. We have already observed the conformity in the influence of the climates of Spain and Chorazan, a province of Persia, upon the hair of goats, cats, and rabbits; it acts in the same manner upon the wool of sheep,

which is very fine in Spain, and still finer in that of Persia.

3. The broad-tailed sheep, whose wool is also very fine in temperate countries, such as Persia, Syria, and Egypt; but which in warm countries, changes into hair more or less coarse.

4 The *strepsicheros*, or Candian sheep, who resembles ours both in wool and make, excepting the horns, which are erect, and in the form of a screw.

5. The *adimain*, or great sheep of Senegal and India, which are covered with hair more or less short or coarse according to the heat of the climate. All these sheep are only varieties of the same species, and certainly would produce with each other, since we know from experience that the he goat, whose species is further distant, copulates with our ewes. But though these five or six races of domestic sheep are all varieties of the same species, entirely produced by the difference of climate, treatment, and food, yet none of them appear to be the primitive stock from whence the others sprung; nor is there any of them strong or swift enough either to resist, or avoid, carnivorous animals, by flight. They all equally need

Engrav'd for Barr's Buffon.

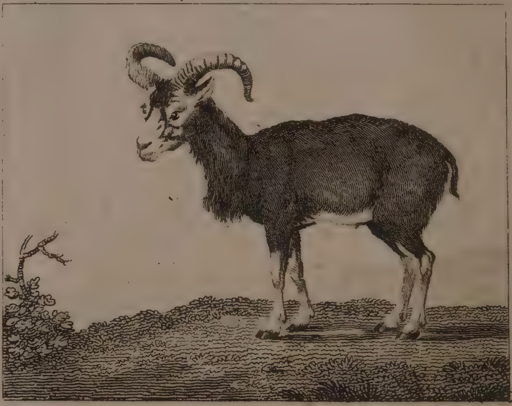

FIG. 139.

Moufflon.

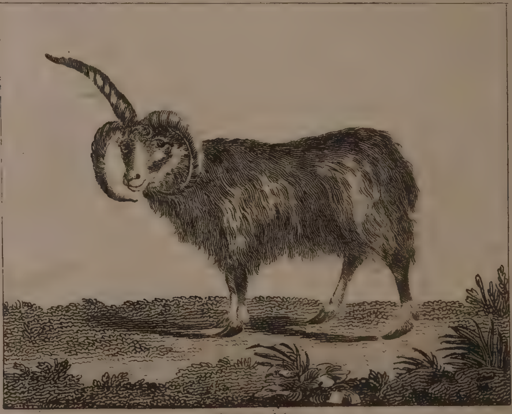

FIG. 140.

Iceland Ram.

need care and protection, and must all, therefore, be looked upon as degenerate races, formed by the hands of man, and multiplied for his use. At the same that he fed, cultivated, and increased these domestic races, he neglected, hunted, and destroyed the wild breed, which being stronger and less tractable, would, consequently, be more troublesome, and less useful; they are, therefore, only to be met with in small numbers, and in thinly inhabited places, where they can support themselves. In the mountains of Greece, in the islands of Cyprus, Sardinia, and Corsica, and in the desarts of Tartary, the animal, which we call the *muflon* (*fig.* 139), is still to be found, and which in my opinion is the primitive stock of all the varieties of sheep; he lives in a state of nature, and subsists and multiplies without the help of man; he resembles the several kinds of domestic sheep more than any other wild animal; he is more lively, stronger, and swifter, than any of them; his head, forehead, eyes, and face, are like the ram's; he resembles him also in the form of the horns, and in the whole habit of the body; in short, he produces with the domestic sheep, which alone is sufficient to demonstrate that he is of the same species, and the primitive stock of the different breeds.

The only difference betwixt the muflon and our sheep is, that the first is covered with hair instead of wool; but we have already observed, that even in domestic sheep the wool is not an essential character, but a production of temperate climates, since in hot countries these same sheep have no wool, and are all covered with hair; and that, in cold countries, their wool is as coarse as hair. Hence it is not astonishing that the primitive wild sheep, who must have endured cold and heat, have lived and increased without shelter in the woods and deserts should not be covered with wool, which he would soon be deprived of among the thickets; and its nature would, in a short time, be changed by the action of the air, and intemperature of the seasons. Besides, when a he-goat copulates with a domestic ewe, the produce is a kind of muflon, for the lamb is covered with hair, and is not a barren mule, but a mongrel, which returns towards the original species, and which appears to indicate, that the goats and domestic sheep have something in common with their origin; and, as we know by experience, that the he-goat very readily copulates with the ewe, but that the ram is incapable of impregnating the she-goat, it is not to be doubted, that, when these animals are in a domestic state, the goat is the predominant species. Thus our sheep is a species much more degenerated than that of the goat, and there is every reason to believe that if the muflon were brought to the she-goat, instead of a domestic ram, she would produce kids approaching nearer to the species of the goat, as the lambs produced between the he-goat and ewe return nearer to the species of the ram.

I know that naturalists, who have founded their knowledge of Natural History on the distinction of some particular characters, may make some objections to this doctrine, and, therefore, I shall endeavour to anticipate them. The first character of the sheep, they will say, is to be clothed with wool, and that of the goat with hair. The second character of the ram is to have circular horns, which turn backwards, and that of the he-goat is to have them straight and erect. These, they will affirm, are the distinctive and infallible marks by which sheep and goats will always be distinguished; for as to the rest, they cannot avoid acknowledging, they belong to them both in common. Neither have incisive teeth in the upper jaw, but each of them have eight in the lower; both want the canine teeth, and both have cloven feet, simple and permanent horns, teats in the same parts of the belly, both live upon herbage, and ruminate. The internal organization has still a greater resemblance, for it appears to be absolutely the same; the number and form of their stomachs, the disposition of the viscera and intestines, the substance of their flesh, the qualities of the fat and seminal liquor, the time they go with young, and the length of their lives, are perfectly the same. There only remains, then, the wool and the horns, by which these two species can be distinguished; but we have already demonstrated by facts, that wool is not so much a substance of nature as a production of climate, assisted by the care of man. The sheep of hot and cold countries, and those which are wild, have no wool, but hair, while the goats in very mild countries have rather wool than hair, for that of the Angola goat is finer than the wool of our sheep. This character, therefore, is not essential, but purely accidental, and even equivocal, since it equally belongs to, or is deficient, in both species, according to the difference of climate. The character of the horns appears to be still more uncertain; they vary in number, size, form, and direction. In our domestic sheep the rams have commonly horns, and the ewes have none; nevertheless, I have seen in our flocks rams without horns and ewes with them; and sheep not only with two but four horns. The sheep of the North, and of Iceland, (*fig.* 140) have sometimes even eight. In hot countries the rams have only two very short horns, and often are deficient of them as well as the ewes. In some the horns are smooth and round, in others they are furrowed and flat, and the points instead of turning back, are often bent and come forward, &c. This character, therefore, is not more constant than the first, and consequently, not sufficient to constitute a different species; the largeness of the tail has also been considered, by some naturalists, as an essential distinction, and from the difference in the size of that, the wool, and the horns, they have made seven or eight different species of these animals, which we have reduced to one; and this reduction appears to be so well founded, that we are not afraid of its being contradicted by future observation.

It appeared necessary in composing the History of Wild Animals, to consider them one by one, and independently of genus; but on the contrary, in domestic animals, it appears requisite even to extend the genera; because, in Nature, there only exists individuals, and succession of individuals, that is, species. Men have had no influence on independent animals, but they have greatly altered, modified, and changed domestic ones; therefore, we have made physical and real generas, greatly different from metaphysical and arbitrary ones, which have never existed but in idea. These physical genera, are in reality composed of all the species, which by our management have been modified and changed, and as all these species so differently altered by the hand of man, have but one common and simple origin in nature, the whole genus ought to form but one species. For example, in writing the history of tigers, we have admitted as many species as are found in all the different parts of the world, because, we are certain that man has never subjected, nor changed the species of those untractable animals, which subsist at present such as Nature produced them. It is the same with all other free and independent animals. But in composing the history of oxen and sheep, we have reduced all the first under the species of a single ox; and the latter under that of a single sheep, because, it is also certain, that man, and not Nature, has produced the different kinds which we have enumerated. Every thing concurs to support this idea, which, although clear in itself, may not, perhaps, be sufficiently understood. That all the different oxen produce together, we have demonstrated by the experience of M. de la Nux, and the testimonies of Messrs. Mentzelius and Kalm; that the sheep also produce with one another, with the muflon, and even with the he-goat; I know from my own experience. All the different kinds of oxen, therefore, are no more than one species, and all the sheep but another, however extended the genus of both may be.

I shall never cease to repeat (seeing the importance of the subject) that it is not by trivial particular characters we can judge of Nature, or distinguish the species; that methodical arrangements, far from elucidating the History of Animals, serve but to obscure it by multiplying unnecessary denominations and species; by making arbitrary genera which are not in Nature, and perpetually confounding real beings with imaginary creatures; by giving false ideas of the characteristics of the species, and mixing or separating them without foundation, without knowledge, and often without having seen a single individual. It is hence that our nomenclators constantly deceive themselves, and write almost as many errors as lines. We have already given so many examples of this, that he must be blindly prejudiced indeed, that can in the least doubt them. Monsieur Gmelin speaks very sensibly on this subject, when treating of the animal in question.*

We are convinced, as M. Gmelin observes, that we cannot acquire a knowledge of Nature, but by making a judicious use of our senses, by reflecting, seeing, comparing, and, at the same time, by rejecting the bold freedom of forming methodical orders, and minute systems, in which animals are classed without the authors having seen them, and of which they are only acquainted with the names; names which are often equivocal, obscure, and misapplied. The wrong use of these names confounds the ideas in vague and indefinite words, and drowns the truth in a torrent of error. We are also convinced, after having compared the living mouflon with the description of M. Gmelin, that the argali is the same animal. We have said they are found in Europe, and in warm countries, such as Greece, the island of Cyprus, Sardinia, and Corsica; nevertheless, they are found also, and in great numbers, in all the mountains of the southern parts of Siberia, under a climate rather cold than temperate, and where they appear even to be bigger, stronger, and more vigorous. He might,

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* Vide Voyage à Kamtscatka, par M. Gmelin.

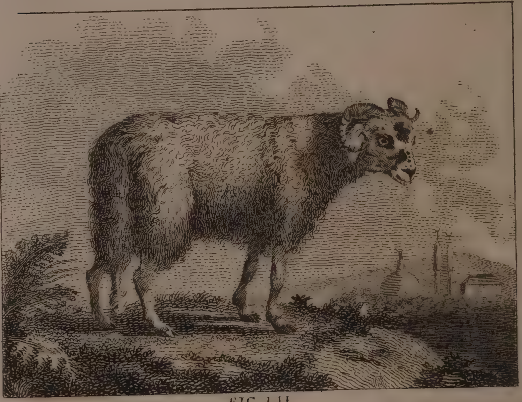

FIG. 141

Barbary Wedder

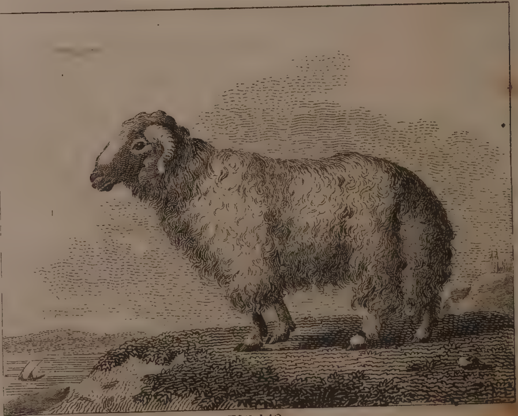

FIG. 142

Ram of Tunis

might, therefore, have stocked the north and south parts, and his posterity have become domestic; after having long endured the rigours of this condition, he might have degenerated, taking relative characters, and new habits of body, according to the different climates, and the different treatments he has received; which being afterwards perpetuated by generation, have given rise to our domestic, and all other kinds of sheep, of which we have heretofore spoken.

SUPPLEMENT.

IN the year 1774, a ram was exhibited at the fair of St. Germain, as a ram of the Cape of Good Hope; but we found it had been purchased at Tunis, and considered it to be of the same species as the Barbary sheep, (*fig.* 141.) before mentioned, for it differed only by the head and tail being somewhat more short and thick; yet by way of distinction, we have called it the ram of Tunis. (*fig.* 142.) His legs were shorter than those of our common sheep; he was plentifully clothed with wool, and his horns both in size and shape nearly resembled the Barbary sheep. In the same year, and at the same place, there was also another shewn under the name of the Morvant of China, (*fig*. 143.) which was remarkable for having a sort of mane on his neck, and long hairs hanging down under his throat, which were a mixture of red and grey, and full ten inches long; the mane extended to about the middle of the back, the hairs of which were not so long as those under the throat, were more red, mixed with a few brown and black ones; the wool which covered the other part of the body was rather curled, near three inches long, and of a bright yellow; his legs were red, spotted with yellow, and his tail yellow and white; he was not so high as the common rams, and more resembled the Indian rams than them; he had a very large belly, in appearance like that of an ewe with young, and his horns were like those of the common kind.

From what we have since observed we are the more convinced in our former opinion, that the muflon is the original stock of all other sheep, and that he has a constitution sufficiently strong to live either in cold, temperate, or warm climates. M. Steller says, that the rams of Kamtschatka have the manner of the goat, and the hair of the rein-deer; that some of their horns weigh more than thirty pounds; that they are as active as roebucks,

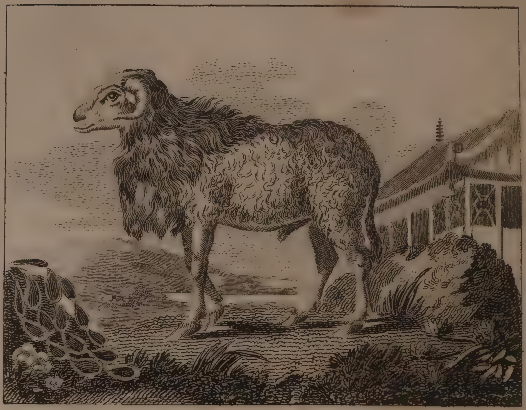

FIG.143

Morvant

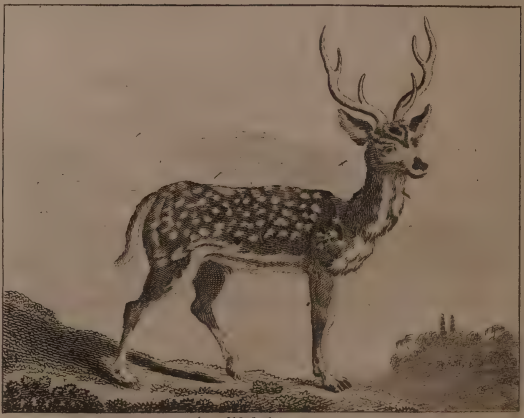

FIG.144

Axis

bucks, and live upon the edges of mountains, that their flesh is good, but they are principally hunted for their skins.

There remain but very few real muflons in Corsica, the many wars in that island having probably been the cause of their destruction, but the present race of sheep still retain a resemblance to them in their figures, as I observed to be the case in one I saw in August, 1774, belonging to the Duc de Vrilliére.

THE AXIS.

THIS animal being only known by the vague names of the *hind* of *Sardinia*, and the *deer* of the *Ganges*, we have preserved the name given him by Belon, and which he borrowed from Pliny; because, the character of Pliny's axis agrees with this animal, and the name has never been applied to any other; and, therefore, we are not afraid of falling into confusion or error, for a generic denomination, joined to an epithet derived from the climate, is not a name, but a phrase, by which we may confound one animal with others of his genus, as this with the stag, although, perhaps, it is really distinct both in species and climate. The axis (*fig*. 144.) is one of the small number of ruminating animals who has horns like the stag. He has the shape and swiftness of the fallow-deer. But what distinguishes him from both is, his having the horns of the former, and figure of the latter; his body is marked with white spots,* elegantly disposed, and separated one from another; and lastly, he is a native of warm countries;† while the stag and fallow-deer have their coats generally of a uniform colour, and are to be met with in greater numbers in cold and temperate regions than in warm climates.

The gentlemen of the Academy of Sciences have given the figure and description of the interior parts of this animal, but say very little of his exterior form, and nothing with respect to his history. They have only called him the *Sardinian hind*, because, probably, they received that name from the royal menagerie, where there is one of them; but there is no proof of this animal's being a native of Sardinia. No author has mentioned that he exists in that island, as a wild animal; but on the contrary, we see by the passages we have quoted, that he is found in the warmest countries of Asia. Thus the denomination of *Sardinian hind*, has been falsely applied; that of the *Ganges stag* agrees best, if he really were of the same species as the stag, since that part of India, which the Ganges waters, appears to be his native country. He is also to be met with in Barbary, and, it is probable, that the spotted fallow-deer of the Cape of Good Hope, is the same animal.

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* The axis is about the size of the fallow-deer, the ground colour of his body is a greyish yellow beautifully marked with white spots; his belly is white, as is also the under part of his tail, while the upper inclines to red.

† I never saw, at Senegal, any stag with horns like those in France. *Voyage de le Maire.*—There are stags in the peninsula of India, on this side the Ganges, whose bodies are interspersed with white spots. *Voyage de la Compagnie des Indes de Hollande.*—There are stags at Bengal spotted like tigers. *Voyage de Luillier.*

We have already remarked, that no species approaches so near each other, as that of the fallow-deer to the stag: nevertheless, the axis appears to be an intermediate shade between the two. He resembles the fallow deer in the size of his body, length of his tail, and his coat, which is the same during his whole life: the only essential difference is in his horns, which nearly resemble those of the stag. The axis, therefore, may be only a variety depending on the climate, and not a different species from that of the fallow-deer;

for, although he is a native of the warmest countries of Asia, he exists and multiplies easily in Europe. There are many herds of them in the royal menagerie; and they produce together as freely as the fallow-deer. It has never, however, been observed, that they mix either with the fallow-deer, or with the stags, and this is the cause of our presuming, that they are not a variety of one or the other, but a particular and intermediate species. But as no direct and decisive experiments on this subject have yet been made, and as no necessary means has been used to oblige these animals to unite, we will not positively affirm that they are two different species.

We have already seen, under the articles of stag and fallow-deer, how many instances these animals give of varieties, especially in the colour of their hair. The species of the fallow-deer and stag, without being very numerous in individuals, is universally diffused; both are met with in either continent, and both are subject to a great number of varieties, which appear to form lasting kinds. The white stags, which are a very ancient race, since the Greeks and Romans mention them, and the small brown stags, which we have called *Corsican stags*, are not the only varieties of this species. There is in Germany another race, known in that country by the name of *Brandhertz*, and by our hunters by that of the *Stag of Ardennes*. This stag is larger than a common stag, and differs from other stags not only by its deeper colour, being almost black, but also by long hair upon the shoulders and on the throat. This kind of mane and beard give him some affinity, the first to the horse, and the latter to the goat. The ancients have given to this stag the compound names of *Hippelaphus* and *Tragelaphus*. As these denominations have occasioned critical discussions, in which the most learned naturalists are not agreed, and as Gesner, Caius, and others, have said, that the hippelaphus was the rein-deer, we shall here give the reasons which have occasioned us to think differently, and have led us to suppose that the hippelaphus of Aristotle is the same animal as the tragelaphus of Pliny, and that both these names equally denote the stag of Ardennes.

Aristotle gives to his hippelaphus a kind of mane upon the neck and upon the upper part of the shoulders, a beard under the throat, horns to the male resembling those of the roe-bucks, and no horns to the female. He says, that the hippelaphus is of the size of a stag, and is found among the Arachotas,

tas, a people of India, where wild oxen are also to be met with, whose bodies are robust, their skins black, their muzzles raised, and their horns bent more backwards than those of the domestic oxen. It must be acknowledged, that Aristotle's characters of the hippelaphus, agree nearly with those of the rein-deer and the stag of Ardennes; they both have long hair upon the neck and shoulders, and also on the throat, which forms a kind of beard on the gullet, and not on the chin; but the hippelaphus, being only of the size of the stag, differs in that from the rein-deer, who is much larger: and what appears to me decisive on the question is, that the rein-deer being an animal belonging to cold countries, never existed among the Arachotas. The country of the Arachotas is one of the provinces which Alexander travelled over in his expedition into India; it is situated beyond Mount Caucasus, between Persia and India. This hot climate never produced any rein-deer, as they cannot exist even in temperate countries, and are only to be met with in the northern regions of both continents. Stags, on the contrary, are not particularly attached to the north, but are to be found in great numbers in warm and temperate climates. Thus we cannot doubt but the hippelaphus of Aristotle, which is met with among the Arachotas, and in the same countries with the buffalo, is the stag of Ardennes, and not the rein-deer.

If we now compare what Pliny says upon the tragelaphus with what Aristotle says upon the hippelaphus, and both with Nature, we shall find, that the tragelaphus is the same animal as the hippelaphus, and therefore the same as our stag of Ardennes. Pliny says, that the tragelaphus is of the stag species,* and only differs from him by the beard and the hair on his shoulders. These characters are positive, and can only be applied to the stag of Ardennes; for Pliny speaks elsewhere of the rein-deer under the name of *Alcé*. We think ourselves, therefore, sufficiently warranted to pronounce, that the tragelaphus of Pliny, and the hippelapus of Aristotle, both denote the animal we call the *Stag of Ardennes;* and that the axis of Pliny is the animal commonly called the *Ganges Stag*. Though names have no influence on Nature, yet an explication of them is doing service to those who study her productions.

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* Eadem est specie (cervi videlicet) barbâ tantum; et armorum villo distans quem *tragelaphon* vocant non alibi quam juxta Phasius amnem nascens. *Pliny*. Hist. Lib. viii. c. 33.

SUPPLEMENT.

IN a letter I received from Mr. Colinson, in 1765, he informed me that the Duke of Richmond had several of the species of the Ganges Stags, or, as I have called it, Axis, in his park; that they lived familiarly with the fallow-deer, did not form separate herds, but even propagated together, and that from the intermixture beautiful varieties were produced.

There was a male and female Chinese fallow-deer in the royal menagerie in the year 1764; they were above two feet four inches in height; they were dark brown on the body and tail, mixed in several places with large yellow hairs, and yellow on the belly and legs. Though smaller than either the fallow-deer or axis, it was probably only a variety of the latter, and with whom it might intermix and be perpetuated even in France, especially as they are both natives of the eastern regions of Africa.*

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* SONNINI observes, that the snout of the axis is shorter than that of the stag, and his head is nearly as long as that of the fallow deer.

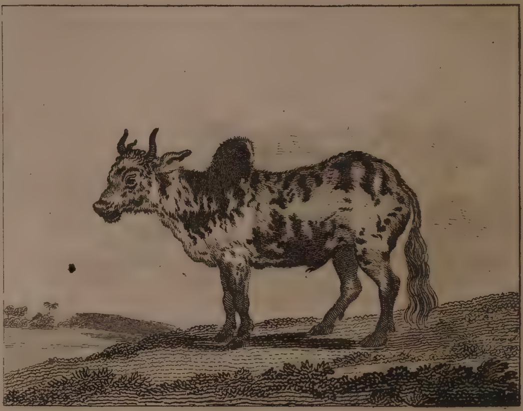

FIG.145

Zebu

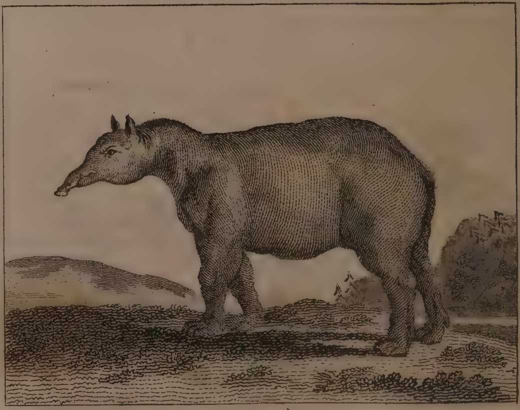

FIG.146

Tapir

THE TAPIR.

THE Tapir (*fig.* 146.) is the largest animal in America, of that New World, where, as we have before observed, animated Nature seems to be lessened, or rather has not had time to arrive at its full dimensions. In place of the colossal masses, which the ancient lands of Asia produce; instead of the elephant, rhinoceros, hippopotamus, camel, &c. we only meet in these new countries with animals modelled upon a small scale; the tapir, lama, pacos, and cabiais, are above twenty times smaller than those they should be compared with in the old continent. Matter is not only used here with prodigious parsimony, but even the forms are imperfect, and appear to have failed or been neglected. The animals of South America, which alone properly belong to this new continent, are almost all without tusks, horns, and tails; their figure is grotesque, their bodies and limbs ill proportioned, and some, as the ant-eaters, sloth, &c. are so miserably formed, that they scarcely have the faculties of moving or of eating; with pain they drag on a languishing life in the solitude of a desart, and cannot subsist in the inhabited regions, where man and powerful animals would have soon destroyed them.

The tapir is of the size of a small cow or zebu, but without horns or tail; his legs are short, and his body arched like that of a hog. When young his coat is spotted like that of the stag, and afterwards becomes of an uniform dark brown colour. His head is thick and long, with a kind of trunk like the rhinoceros; he has ten cutting teeth, and ten grinders, in each jaw; a character which separates him entirely from the ox, and other ruminating animals. As we have only some skins of this animal, and a drawing which M. de la Condamine favoured us with, we cannot do better than refer to the descriptions given of him from life, by Marcgrave* and Barrere†, at the same time, subjoining what travellers and historians have said concerning him.

The tapir appears to be a dull and gloomy animal, who never stirs out but in the night,* and delights in the water, where he oftener lives than upon land: he chiefly lives in marshes, and seldom goes far from the borders of rivers or lakes. When alarmed, pursued, or wounded, he plunges into the water, and remains under it until he has passed to a considerable distance. These customs, which he has in common with the hippopotamus, have made some naturalists imagine him to be of the same species; but they differ as much from each other in nature as the climates are distant which they inhabit. To be assured of this, there needs no more than to compare the descriptions we have recited, with those we have given of the hippopotamus. Although the tapir inhabits the water, he does not feed upon fish; and although his mouth is armed with twenty sharp and incisive teeth, he is not carnivorous. He lives upon plants and roots, and makes no use of his weapons against other animals. He is of a mild and timid nature, and flies from every attack or danger. His legs are short, and his body heavy, but, notwithstanding, he runs very swift, and swims still better than he runs. His skin is of a very firm texture, and so bound together that it often resists a bullet. His flesh is insipid and coarse; nevertheless the Indians eat it. They commonly go in companies, and are found in Brasil, Paraguay, Guiana, and in all the extent of South America, from the extremity of Chili to New Spain.

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* Marcgrave's Hist. Brasil.

† The tapir, or, as he is sometimes called, the Maipouri, is an amphibious animal, being as much in the water as on land; he has very short hair, interspersed with black and white hairs. *Nat. Hist. par Barrere.*

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* Sonnini says, that it is true the tapir goes ouc principally in the night, but he is also to be met with in the day.

THE ZEBRA.

THE Zebra (*fig.* 146.) is perhaps the handsomest and most elegant of all quadrupeds. He has the figure and gracefulness of the horse, with the swiftness of the stag. His striped robe of black and white ribbands, is alternately disposed with so much regularity and symmetry, that it seems as if nature had made use of the rule and compass. The alternate bands of black and white, are the more singular, as they are strait, parallel, and as exactly divided, as those of a striped stuff; besides they extend not only over the body, but over the head, thighs, legs, and even the ears and tail; so that, at a distance, this animal appears as if he was adorned with ribbands, disposed in a regular and elegant manner over every part of the body. In the females, these bands are alternately black and

Engraved for Barrs Buffon

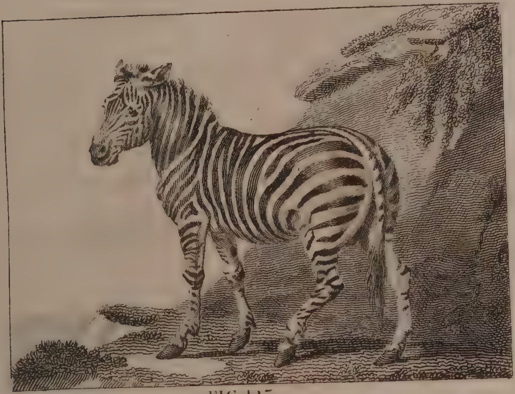

FIG. 147

Zebra

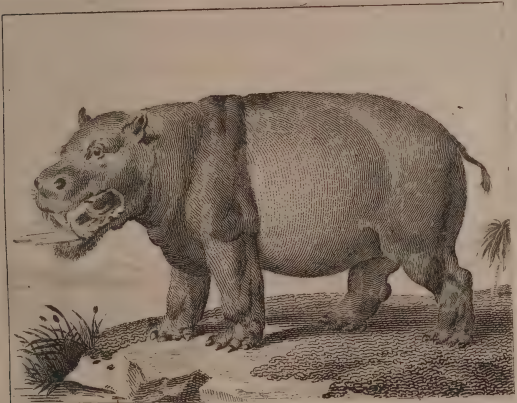

FIG. 148

Hippopotamus

and white; in the males they are black and yellow; but the shades are always lively and brilliant, upon a short, fine, and thick hair, the lustre of which increases the beauty of the colours. The zebra, in general, is less than the horse, and bigger than the ass. Although he has often been compared to these two animals, by the names of the *wild horse* and the *striped ass*, he is a copy of neither, but might rather be called their model, if all were not equally original in Nature, and if every species had not an equal right to creation.

The zebra, then, is neither a horse nor an ass, for we have never learnt that he intermixes with either, though trials have often been made for that purpose. She-asses, when in heat, were presented to the zebra, which was in the menagerie of Versailles, in the year 1761; but he disdained them, or rather, shewed no sign of emotions; he played with, and even mounted on them, but without any external marks of desire; and this coldness could be attributed to no other cause than the disagreement of their natures; for this zebra was then four years of age, and was very lively and alert in every other exercise.

The zebra is not the animal the ancients have mentioned under the name of *onagre*. In the

Levant, in the eastern parts of Asia, and in the north of Africa, there exists a beautiful race of asses, which, like the finest horses, are natives of Arabia. This race differs from the common kind, by the largeness of the body, the slenderness of the legs, and the lustre of the hair. They are of an uniform colour, commonly of a fine mouse grey, with a black cross on the back and shoulders, sometimes they are of a bright grey, with a flaxen cross. These asses of Africa and Asia, although more beautiful than those of Europe, are originally, and equally descended from the *onagres*, or *wild asses*, which are still in great plenty in East and South Tartary, Persia, Syria, the islands of the Archipelago, and all Mauritania. The onagres differ from our domestic asses only by the qualities resulting from freedom and independence; they are stronger and swifter, and have more courage and vivacity; the form of their body is the same, but they have longer hair, and this difference varies again according to their condition, for our asses would have hair equally long, if it was not cut off at the age of four or five months. The hair of young asses is at first nearly as long as that of young bears. The hide of the wild ass is also harder than that of the domestic kind, and we are informed that it is covered with small tubercules, and it is even said that the *shagreen* brought from the Levant, and which we employ for so many purposes, is made of these wild asses skin. But neither the onagres, nor the beautiful asses of Arabia, can be looked upon as the stock of the zebra species, though they resemble them in figure and swiftness. That regular variety of the climate of the zebra has never been exhibited by either of them. This beautiful species is singular, and very distant from any other. The zebra is also of a different climate from the onagre, being only to be met with in the most eastern and southern parts of Africa, from Ethiopia to the Cape of Good Hope, and from thence into Congo. He exists neither in Europe, Asia, America, nor in the northern parts of Africa. Those, which some travellers tell us they saw at the Brasils, had been transported thither from Africa. Others, which have been seen in Persia and in Turkey, have been brought thither from Ethiopia; and, in short, those which we have seen in Europe come almost entirely from the Cape of Good Hope. This point of Africa is their native climate, and where the Dutch have employed all their endeavours to tame and render them domestic, without having hitherto been able to succeed. That which was the subject of this description was very wild when he arrived at the royal menagerie in France, and is not yet entirely tamed; nevertheless, he has been brought to let a man sit on a saddle, but great precaution is necessary, as two men are obliged to hold the bridle while the third is on his back. His mouth is very hard; his ears are so sensible that he winces whenever they are touched. He is restive, like a vicious horse, and obstinate as a mule. But, perhaps, the wild horse, and the onagre, are equally untractable, and, possibly, if the zebra was accustomed to obedience, and to a domestic state, from his earliest days, he might become as gentle as the ass or the horse, and might be substituted in their room.

SUPPLEMENT.

ALTHOUGH the ass is to be met with, either in a wild or domestic state, in almost every country of the old continent, under a warm or temperate climate, yet there was no such animal in the new, upon its first discovery. They were, however, soon after transported from Europe, and multiplied so fast in America, that they may be said to be equally numerous in the four quarters of the globe; but it is not so with the zebra; he seems confined to the southern parts of Africa, and especially about the Cape of Good Hope, although Lopez has asserted that they are more abundant in Barbary than in Congo, and Dapper says the same in favour of the forests of Angola.

Notwithstanding the superiority this animal maintains over the ass, from the elegance of his figure, and beauty of colours, yet he appears to be somewhat of the same species, for almost all travellers have given it the name of striped ass, from being struck at the first sight with his having a greater resemblance to the ass than the horse; it is not, however, with the common ass that they compared him, but that large and beautiful part of the species we have before alluded to; I am, notwithstanding, inclined to the opinion, that the zebra makes a nearer approach to the species of the horse, as he possesses a similar elegance of figure. In favour of this opinion it has been observed, near the Cape of Good Hope, which appears to be the native country of the zebra, but there are horses spotted on the back and bellies, with yellow, black, red, and blue. We will not, however, pretend to undertake the decision of this question; but as the Dutch have transported a number of these animals to Holland, and even yoked them in the Stadtholder's chariot, there is some hopes that their nature will soon be clearly exemplified. In Holland there are many judicious naturalists, and, therefore, we cannot suppose they will fail to make these animals unite among themselves, if not with the horse and the ass: for that attempted in the royal menagerie in 1761, was but a single experiment; it is possible, that as the zebra was but four years old he might not have arrived to maturity, at all events he was not rendered familiar with the females presented to him, a circumstance which seems requisite throughout nature, even in an intercourse with individuals of the same species.

In Tartary they have an animal called *czigithai*, which possibly is of the same species as the zebra, as the principal difference between them is in the colour; a difference which, we have repeatedly observed, may be occasioned by the varieties of the climates. This czigithai is common in the southern parts of Siberia, Thibet, Dauria, and Tartary. Gerbillan says they are to be met with in the country of the Mongoux and Kakas; that they differ from mules, and cannot be brought to carry burthens. Muller and Gmelin both assert that there are numbers of them in the countries of the Tongusians, who hunt them like other game; that they resemble a bright bay horse, excepting they have long ears, and a tail like a cow. It is probable that if they had compared him with the zebra they would have found a much greater resemblance. In the Petersburgh cabinet there are stuffed skins both of the zebra and czigithai; they differ very much in colour, but yet they may belong to the same, or nearly the same species. Besides there is no other animal in Africa but what is to be found in Asia, and, therefore, if these are different species the zebra alone would stand as an exception to that general rule. If the czigithai does not belong to the zebra species it may possibly be the onagre, or wild ass of Asia; which latter should not by any means be confounded with the zebra. According to all travellers there are various kinds of wild asses, and the onagre is supposed to rank at the head of them. The horse, ass, onagre, and czigithai, may form four distinct species; and if there are but three, it will remain uncertain whether the latter is an onagre or zebra. The onagre is said to exceed the horse in swiftness, and the very same remark is made of the czigithai. Let this particular fact be as it may, the horse, ass, zebra, and czigithai, belong to the same genus, and are only different branches thereof. From the two first being rendered domestic, mankind have received great advantages, and the two last being reduced to a similar state would, no doubt, prove likewise a useful acquisition.

THE HIPPOPOTAMUS.

THOUGH the Hippopotamus has been celebrated from the earliest ages; though mentioned in the sacred writings under the name of *behemoth*, and though his figure is engraved upon the obelisks of Egypt, and on the Roman medals; yet he was but imperfectly known to the ancients. Aristotle scarcely mentions him, and in the little he does say, there are more errors than facts. Pliny copied Aristotle, and far from correcting, adds to the number of his errors. It was only towards the middle of the sixteenth century that we had any precise information concerning this animal; Belon being then at Constantinople, saw a living one; of which, however, he has given but an imperfect representation, for the two figures which he has joined to his description, were not taken from the hippopotamus he has seen, but were copied from the reverse of a medal of the Emperor Adrian, and from the colossus of the Nile at Rome; so that we must carry the epoch of the knowledge of this animal to the year 1603, when Frederico Zerenghi, a surgeon of Narni, in Italy, printed at Naples, the history of two of these animals, which he had killed in Egypt, in a great ditch he had caused to be dug in the environs of the Nile, near Damietta. This little work was written in Italian, and appears to have been neglected by his contemporary and succeeding naturalists; notwithstanding, it is the only good and original one on the subject, and has so strong pretensions to credit, that I shall here give an extract and translation from it.

“ With a view of obtaining an hippopotamus, (says Zerenghi) I suborned the people about the Nile, (who had seen two of these animals come from the river) to dig a large pit in the place where they passed over, and to cover it with light wood, earth, and grass. Returning in the evening to the river, they both fell into the pit. The people came immediately and acquainted me with the event, and I hastened thither with my Janissary. We killed both the animals by firing three charges from a large arquebuse into each of their heads. They expired immediately, uttering a doleful cry, which more resembled the bellowing of a buffalo, than the neighing of a horse. This exploit was performed on the 20th of July, 1600. The following day I had them drawn out of the pit, and skinned with care; the one was a male and the other a female. I had both the skins salted, and filled with the leaves of the sugar cane, in order to transport them to Cairo, where I had them salted a second time with greater attention and more convenience. In doing of which we used near 400lbs. of salt to each skin. At my return from Egypt, in 1601, I brought these skins to Venice, and from thence to Rome. I shewed them to many learned physicians. Doctor Jerome Aquapendente and the celebrated Aldrovandus, were the only persons who knew them to be the skins of the hippopotamus; and as the work of Aldrovandus was then printing, he had (with my consent) a figure drawn from the skin of the female, which he has given with his book.

"The hippopotamus has a very thick and hard skin; it is impenetrable, unless it be soaked some time in water: the mouth is not, as the ancients have said, of a moderate size, but enormously large; neither are his feet as they say, divided into two hoofs, but into four. His size is not that of an ass, for he is much bigger than the largest horse, or buffalo; he has not a tail like that of the hog, but rather that of the tortoise, except being incomparably larger; his mouth or nose is not elevated, but resembles that of the buffalo. and is much larger; he has no mane like the horse, but only some short hairs; he does not neigh like the horse, but his voice is between the bellowing of the buffalo, and the neighing of the former. His teeth do not jut out of his mouth, for when it is shut, the teeth, although extremely large, are all hid under the lips. The inhabitants of this part of Egypt call him *foras l'bar*, which signifies a *sea-horse*. Belon is much deceived in his description of this animal, he attributes to him teeth like those of a horse, which would induce me to think he had never seen him, although, as he tells us he had, for the teeth of the hippopotamus are very large and very singular. To clear up every doubt and uncertainty, continues Zerenghi, I have here given the figure of the female hippopotamus; every proportion has been taken exactly after nature, as well as the measure of its body and limbs.

"The length of this hippopotamus, from the extremity of the upper lip to the beginning of the tail, is nearly eleven feet two inches.*

"The circumference of the body is about ten feet.

"The height, from the bottom of the foot to the top of the back, is four feet five inches.

"The circumference of the legs near the shoulders is two feet nine inches; and taken lower, is one foot nine inches and a half.

"The height of the legs, from the bottom of the feet to the breast, is one foot ten inches and a half.

"The length of the feet, from the extremity of the nails, is about four inches and a half.—*Note.* I have taken the medium measure between the two that Zerenghi gives, for the length of the feet.

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* This measurement is according to Paris feet and inches.

"The nails are as long as they are broad, being rather more than two inches.

"There is one nail on each toe, and four toes on each foot.

"The skin upon the back is nearly an inch, and that upon the belly about half an inch thick.

"The skin is so hard when dried, that it cannot be pierced by a musket shot. The people of the country make great shields of it, and cut it into thongs or kind of whips. On the surface of the skin there are a few very fine hairs of a greyish colour, and which cannot be perceived at first sight; on the neck there are some longer, but they are all placed one by one, more or less distant from each other; but on the lips they form a kind of mustachio: for there springs out ten or twelve of them from the same points; these hairs are of the same colour as the rest, they are only harder, thicker, and somewhat longer, though the longest is not more than half an inch.

"The length of the tail is rather more than eleven inches, and its circumference, taken at the beginning, is something more than a foot, and at its extremity, is two inches and upwards.

"The tail is not round, but from the middle to the end is flat, like an eel. Upon the tail and the thighs, there are some round scales of a whitish colour, broad as a French bean; these small scales are also seen upon the breast, the neck, and upon some parts of the head.

"The head, from the extremity of the lips to the beginning of the neck, is two feet four inches, and its circumference about five feet eight inches.

"The ears are two inches and near an half long, more than two inches in breadth, are a little pointed, and furnished on the inside with thick, short, and fine hairs, of the same colour as the others.

"The space between each angle of the eyes is two inches and upwards, and from one eyelid to the other, is one inch and one line.

"The nostrils are two inches four lines long, and little more than one inch broad.

"The mouth, when open, measures about one foot six inches; it is of a square form, and furnished with forty-four teeth of different shapes. All these teeth are so hard, that they strike fire with steel. The enamel of the canine teeth in particular, have this hardness; the interior substance being not so hard. When the hippopotamus keeps his mouth shut there are no teeth to be seen, for the lips, which are extremely large, completely cover them.

" In respect to the figure of this animal, it may be said to be constructed between that of the buffalo and hog, because it participates of both, except the incisive teeth, which have no resemblance to those of either of these animals. The grinders are a little like those of the buffalo or horse, but much larger. The colour of the body is dark and blackish. It is affirmed that the hippopotamus produces but one young at a birth; that he lives on fish, crocodiles, and even the flesh of dead bodies; however, he eats rice, grain, &c. though on considering his teeth, we should conclude that Nature had not made him for grazing, but for the destruction of other animals."

Zerenghi finishes his description by affirming that all the above measures were taken from the female hippopotamus, whom the male perfectly resembled, excepting that he was a third bigger in all his dimensions. It were to be wished that the figure given by Zerenghi had been as good as his description; but the drawing was not taken while this animal was living, but from the skin of the female. It appears also, that it was from this same skin preserved in salt, that Fabius Columna designed his figure; but the description Columna has given, is not so good as that of Zerenghi's, and he must be reproached for only quoting the name and not a word about the work of this author, though published three years before his own: he must also be accused of swerving from his description in many essential points, without giving any reason for it; for example, Columna says, that in his time, in 1603, Frederico Zerenghi brought from Egypt to Italy an hippopotamus preserved in salt, while Zerenghi himself says, he brought only the skin. Columna also gives to his hippopotamus thirteen feet in length, to the circumference fourteen, and the legs three feet and a half long; while the measures of Zerenghi makes the length of the body but eleven feet two inches, the circumference ten, and the legs one foot ten inches and a half, &c. We must not, therefore, rely on the description of Columna; nor excuse him upon the supposition that he took it from another subject; for it is evident, from his own words, that he made it from the smallest of Zerenghi's two hippopotami; since he acknowledges that some months after Zerenghi shewed a second hippopotamus much larger than the first. What makes me so strenuous on this point is, that no one has rendered justice to Zerenghi, who, notwithstanding, is the only person who deserves eulogiums on this subject. On the contrary, every naturalist, for this hundred and sixty years, have attributed to Fabius Columna what they should have given to Zerenghi ; and instead of searching for the work of the last they have set down contented with copying and applauding that of Columna's, who, however deserving of praise in other respects is, upon this, neither original, exact, nor even honest.

The description and figures of the hippopotamus that Prosper Alpinus published more than a hundred years after, are still worse than those of Columna, having been drawn from skins but badly preserved ; and M. de Jussieu, who wrote of the hippopotamus in 1724, has only described the skeleton of the head and feet.

By comparing these descriptions, and especially that of Zerenghi, with the information we have drawn from travellers, the hippopotamus appears to be an animal whose body is longer and as thick as that of the rhinoceros ; that his legs are much shorter ; that his head is not so long, but larger in proportion to his body ; that he has no horns, either on the nose like the rhinoceros, or on the head like the ruminating animals. His cry when hurt, according to ancient and modern travellers, resembles the neighing of a horse and the bellowing of the buffalo; his usual voice may be like the neighing of a horse, from which, however, he differs in every other respect. If this be the fact, we may presume that this resemblance in the voice has been the reason for giving him the name of *hippopotamus*, which signifies the *river horse*; as the howling of the lynx, which resembles that of the wolf, occasioned him to be called the *lupus cervarius*. The cutting teeth of the hippopotamus, and especially the two canine of the lower jaw, are very long, and so hard and strong that they strike fire with a piece of steel. This is probably what gave rise to the fable of the ancients, that the hippopotamus vomited fire: these canine teeth are so white, so clean, and so hard, that they are preferable to ivory for making artificial teeth. The cutting teeth, especially those of the lower jaw, are very long, cylindrical and furrowed; the canine teeth are also very long, crooked, prismatic, and sharp, like the tusks of a boar: the grinders are square, or rather oblong, nearly like those of a man, and so large that a single one weighs more than three pounds; the largest of the cutting, and the canine teeth are twelve and even sixteen inches in length, and sometimes weigh twelve or thirteen pounds each.

In short, to give a just idea of the size of the hippopotamus we shall make use of Zerenghi's measures, increasing them one third, because his measures were taken from the female, who was one third less than the male in all her dimensions. This male hippopotamus was consequently sixteen feet nine inches long, from the extremity of the muzzle to the beginning of the tail; fifteen feet in circumference, and six feet and a half in height; his legs were about two feet ten inches long; the length of the head three feet and a half, and eight feet and a half in circumference; the width of the mouth two feet four inches, and the largest teeth more than a foot long.

Thus powerfully armed, and with such prodigious strength of body, he might render himself formidable to every animal; but he is naturally gentle, and is besides so heavy and slow that he could not outrun any other quadruped. He swims quicker than he runs, pursues the fish, and makes them his prey. He delights much in the water, and lives in it as freely as upon land, yet he has no membranes between his toes like the beaver and otter, and it is plain, that the great ease with which he swims is owing to the great capacity of his body, which makes his specific gravity nearly equal to the water. Besides, he remains a long time under water, and walks at the bottom as well as in the open air; and when he quits it to graze upon land he eats sugar-canes, rushes, millet, rice, roots, &c. of which he consumes great quantities, and does much injury to cultivated lands; but as he is more timid on land than in the water he is very easily driven away, and his legs are so short that he cannot save himself by flight, if he be far from any water. His resource, when in danger, is to plunge into the water, and proceed under it to a great distance before he reappears. He commonly retreats from his pursuers, when hunted, but if wounded he becomes irritated, and faces about with great fury, rushes against the boats, seizes them with his teeth, tears pieces off, and sometimes sinks them. "I have seen, says a traveller,* an hippopotamus open his mouth, fix one tooth on the gunnel of a boat, and another on the second plank under the keel (that is at least four feet distant), pierce the side through and through, and in this manner sink the boat. I have seen one lying by the side of the sea-shore, upon whom the waves tossed a Dutch boat heavily laden, and then retreating left it dry on his back, and which was afterwards carried off again by another wave, without the animal appearing to have received the least injury. I could not discover the exact arrangement of his teeth, but they appear to form the figure of a bow, and were about sixteen inches long. We fired several times at one of them, but the shot rebounded from his skin. The natives consider him as a kind of deity, and that he cannot be destroyed, and frequently declare, if they were to use him as we do he would soon be the destruction of their nets and canoes. When they go a fishing in their canoes, and meet with an hippopotamus, they throw fish to him, and then he passes on without disturbing their fishery any more. He does the most injury when he can rest himself against the earth, but when he floats in the water he can only bite. Once, when our boat lay near the shore, I saw one of them get underneath, lift her above water upon his back, and overset her with six men aboard, but fortunately they received no hurt."——" We dare not, says another traveller, irritate the hippopotamus in the water, since an adventure that had nearly proved fatal to three men; they had proceeded in a small canoe to attack one in a river where there was about ten feet water; they discovered him walking at the bottom, according to his usual custom, and wounded him with a long lance, upon which he rose immediately to the surface of the water, looked at them with a dreadful aspect, and, at one bite, took a great piece out of the side of the canoe, which had very nearly overturned it, and it was with difficulty they could make the shore." These two examples are sufficient to give an idea of the strength of these animals; and a number of like facts are to be met with in the General History of Voyages, by the Abbé Prevost, who has given a summary of whatever travellers have reported concerning the hippopotamus.

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* Dampier, vol. II.

These animals are not numerous, except in particular places, and it even appears that they are confined to the rivers of Africa. The greatest part of naturalists have said, that the hippopotamus is to be found also in the Indies, but the evidence they have of this circumstance is very equivocal; the most positive would be that of Alexander, in his letter to Aristotle, if we could assure ourselves, that the animals of which Alexander speaks, were really hippopotami. What occasions me to have some doubts on this head is, that Aristotle, in describing the hippopotamus in his history of animals, must have said, that they were natives of India, as well as Egypt, if he had thought that the animal, of which Alexander speaks in his letter, had been the true hippopotamus. Onesicritus, and some other authors, say the hippopotamus is to be found in the river Indus, but modern travellers, at least those who merit most confidence, have not confirmed this fact; they all agree, that this animal is found in the Nile, the Senegal, or Niger, the Gambia, the Zara, and other great rivers and lakes of Africa, especially in the southern and eastern parts. Father Boyn is the only one who seems to insinuate that the hippopotamus is to be met with in Asia, but his recital appears suspicious, and I think only proves that he is common in Mosambique, and all the eastern parts of Africa. At present the hippopotamus, which is called the *Nile-horse*, is so rare in the lower Nile, that the inhabitants of Egypt have no idea of the name. He is equally unknown in all the northern parts of Africa, from the Mediterranean to the Bamboo river, which flows at the foot of Mount Atlas; the climate which the hippopotamus actually inhabits, therefore extends only from Senegal to Ethiopia, and from thence to the Cape of Good Hope.

As most authors have called the hippopotamus the *sea-horse*, or *sea-cow*, it has sometimes been confounded with the latter, which is a very different animal, and which only inhabits the northern seas. It appears, then, to be certain, that the hippopotami, which the author of the description of Muscovy says are found upon the borders of the sea of Petzora, are no other than sea-cows, and Aldrovandus merits reproach for adopting this opinion without examination, and asserting that the hippopotamus is found in the northern seas: for he not only does not inhabit the north seas, but it appears that he is rarely found in those of the south. The testimonies of Odoardus, Barbossa, and Edward Wotton, recounted by Aldrovandus, and which seem to prove that the hippopotamus inhabits the Indian seas, appear to be almost as equivocal as that in the description of Muscovy; and I am inclined to believe that the hippopotamus is not to be found, at least at present, but in the greatest rivers of Africa. Kolbe, who says, he has seen many of them at the Cape of Good Hope, affirms, that they equally plunge themselves into the sea and rivers, and which is asserted by other authors. Although Kolbe appears to be more exact than common in his description of the hippopotamus, yet it is doubtful whether he saw it so often as he says, since the figure he has joined to his description is worse than those of Columna, Aldrovandus, and Prosper Alpinus, which are all drawn from stuffed skins. It is easy to discover that the figures and description in Kolbe's works, have neither been made on the spot, nor taken from Nature. His descriptions are written from memory, and most of the figures been copied from those of other naturalists; the figure which he gives of the hippopotamus, in particular, bears a great resemblance to the cheropotamus of Prosper Alpinus.

Kolbe, therefore, in affirming, that the hippopotamus lives in the sea, might possibly have copied Pliny, and not spoken from his own observations. Most other authors tell us, that this animal is only to be found in the fresh water lakes and in rivers, sometimes at their mouths, but oftener at a great distance from the sea. There are even travellers, who, like Merollo, are surprised, that the hippopotamus should have been called the sea-horse, because, say they, this animal cannot bear salt water. He commonly remains all day under water, and only quits it at night to graze upon land. The male and female rarely separate. Zerenghi caught both male and female the same day, and in the same ditch. Dutch travellers say, that they bring forth three or four young at a time, but this fact appears to me very suspicious from the evidence which Zerenghi has mentioned. Besides, as the hippopotamus is of an enormous bulk, he is in the class of the elephant, rhinoceros, whale, and all other large animals, who bring forth but one at a time; and this analogy appears to me more certain than all the supposititious testimonies of different travellers.

SUPPLEMENT.

I HAVE been informed by Mr. Bruce that in his travels through Africa he frequently saw hippopotami in Lake Tzana, in Upper Abyssinia, near the sources of the Nile; that in this lake these animals are more numerous than in any other part of the world, and that he saw some which were at least twenty feet in length.

Dr. Klockner, in his translation of the present work, printed at Amsterdam, says, he is surprised that M. de Buffon should have taken no notice of a passage in Diodorus Siculus, respecting the hippopotamus, in which that author observes, "that among the various animals produced by the Nile, the crocodile and hippopotamus deserve the most particular attention; the latter is five cubits long; he has cloven feet like ruminating animals, and in each of his jaws he has three large tusks, somewhat like those of a wild boar; while the prodigious size of his body resembles that of an elephant. His skin is exceedingly hard and strong, possibly more so than that of any other animal. He is amphibious, and remains as perfectly at ease under water as upon land; he, however, comes on shore in the night to seek pasture, and if the species were numerous, they would prove very destructive to the cultivated lands of Egypt. To hunt this animal a number of men assemble, and going in several boats attack him; when once fastened to a rope, they leave him till he is exhausted with plunging and the loss of blood: his flesh is hard, and not good for digestion. Dr. Klockner has also given an account of the manner in which the skin was prepared of the one sent from the Cape of Good Hope, and is now in the Prince of Orange's cabinet, the dimensions of which corresponded very nearly with those of Zerenghi's. He likewise adds, that he was informed by the nephew of Charles

Marias, a peasant of French extraction, who shot this hippopotamus, and from whom he had the relation, that the animal had wandered a considerable way upon land, almost to a place called the Mountains of Snow; this Marias asserted that the hippopotamus runs very swift upon land, and for which reason these peasants, though good hunters, never attempted to attack him but when he was in the water; that it was the practice to watch for him about sun-set, at which time he raises his head above water, and perceiving any object of prey, darts upon it with surprising quickness; during his thus floating on the surface, he keeps his ears in perpetual motion, constantly listening if any noise is near, and while in this position the hunters endeavour to shoot him in the head; when wounded he plunges under the water and traverses about as long as life remains, and then floats to the top; some of the party swim to him, and being fastened by ropes he is dragged on shore by oxen, where he is immediately dissected. A full grown hippopotamus generally yields about 2000lbs. weight of fat, which is salted and sent to the Cape, where it is much esteemed and sells very dear. By compression a mild oil is drawn from it, which in Africa is considered as a certain remedy for diseases in the breast.

In our preceding description of this animal we remarked, that it was probable the hippopotamus was so called from his voice having a resemblance to the neighing of a horse, but from many authentic accounts, we understand that it comes nearer to the cry of the elephant, or the indistinct stammerings of persons who are deaf. When asleep he also makes a snorting noise by which his retreat is discovered at a distance; and of this he seems aware, as he generally lies among reeds upon marshy grounds, and where it is very difficult to come near him.

I cannot consider the remark of Marias, relative to the speed of this animal, as correct; since so far from its being corroborated, all others affirm that the hunters rather attack him on land than in the water, which is a proof they are not afraid of his swiftness; nay, some affirm that it is customary to impede his return by trees and ditches, from his constantly endeavouring to regain the water, where he has no enemy to apprehend, as both crocodiles and sharks carefully avoid him.

As we before observed, his skin is so extremely hard on his back, &c. that neither arrows nor musket balls can pierce it, but it is thinner on the belly and insides of the thighs, at which parts therefore the hunters constantly aim. They sometimes endeavour to break his leg with large blunderbusses, and if they succeed in that their conquest is certain. The negroes who do not hesitate to attack the sharks and crocodiles, commonly avoid the hippopotamus, and would probably never dare to encounter him, but from a presumption that if they fail he cannot overtake them; those of Angola, Congo, Elmina, and the western coasts of Africa, consider him as an inferior deity, but yet they feel no repugnance in devouring his flesh when they can procure it with safety.

The female brings forth among the rushes upon land, but she soon teaches her young to take refuge in the water, and which they do on the smallest alarm. P. Labat asserts, that this animal has sufficient intelligence to let himself blood when he feels a necessity, and that he performs the operation by rubbing a particular part of his skin against a sharp-pointed rock, and that when he thinks he has bled enough he rolls himself in the mud until he has stopped the wound; and it has also been affirmed that the Indian painters make use of his blood as one of their colours.

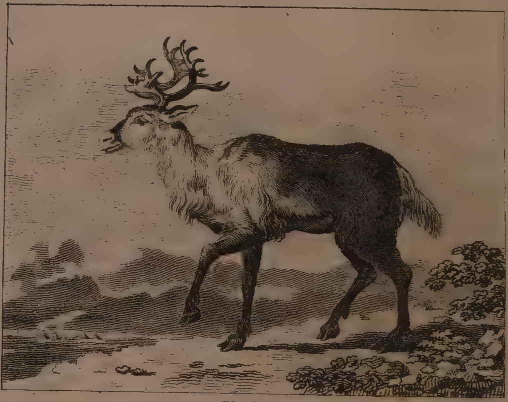

FIG. 150

Rein Deer

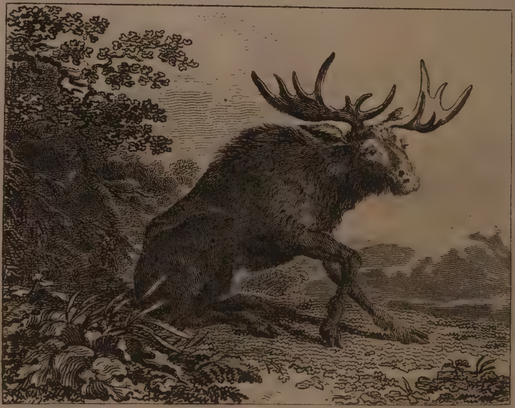

FIG. 149

Elk

THE ELK AND THE REIN-DEER.

ALTHOUGH the Elk (*fig.* 149.) and the Rein-deer (*fig.* 150.) are animals of different species, we shall treat of them together, because it is scarcely possible to write the history of the one without borrowing a great deal from the other. The greatest part of ancient, and even modern authors, have confounded them, or described them by equivocal denominations which might be applied to both. The Greeks had no knowledge either of the elk or the rein-deer, for Aristotle makes no mention of them; and, among the Latins, Julius Cæsar is the first who has made use of the word *Alce.* Pausanias, who wrote above a hundred years after Julius Cæsar, is also the first Greek author who takes notice of this name of A'λκὴ; and Pliny, who was nearly cotemporary with Pausanias, has very obscurely indicated the elk and the rein-deer under the names *alce*, *machlis*, and *tarandus*. We cannot,

not, therefore, say, that the name *alce*, is properly Greek or Latin; it seems to have been derived from the Celtic tongue, in which the elk is named *elch* or *elk*. The Latin name of the rein-deer is still more uncertain; many naturalists have thought that this was the *machlis* of Pliny, because this author, in speaking of the animals of the north, quotes, at the same time, the *alce* and the *machlis*, and says that the last particularly belongs to Scandinavia, and was never seen at Rome, nor even in all the extent of the Roman empire. Nevertheless, we find in Cæsar's Commentaries a passage that we can scarcely apply to any other animal than the rein-deer, and which seems to prove, that he existed at that time in the forests of Germany; and fifteen centuries after Julius Cæsar, Gaston Phœbus seems to speak of the rein-deer under the name of the *rangier*, as an animal which existed in his time in our forests of France: he even gives a tolerable description of this animal*, and of the method of taking and hunting him. As his description cannot be applied to the elk, and as he gives, at the same time, the manner of hunting the stag, the fallow-deer, the wild goat, the chamois goat, &c. it cannot be supposed, that under the article of the *rangier* he intended to speak of any of those animals, or that he was deceived in the application of the name.

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* The Rangier is very much like the stag, but has considerably larger horns: when he is very much pressed in the chace he puts his hind parts against a tree, and bends his head to the ground, in which situation he is perfectly secure, as his horns completely defend his whole body, and the dogs are afraid to approach him. He is not higher than the fallow-

It appears, then, from these positive testimonies, that the rein-deer formerly existed in France, at least in the mountainous parts, such as the Pyrennees, near which Gaston Phœbus dwelt as lord of the county of Foix, and that since his time they had been destroyed like the stags, who were heretofore common in this country. It is certain that the rein-deer is now to be found only in the most northern countries; but we also know, that the climate of France was formerly much more damp and cold, occasioned by the number of woods and morasses, which have since been cut down and drained. By the letter of the Emperor Julian, we learn what was the rigour of cold at Paris in his time: the description he gives of

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fallow-deer, but more bulky; he is hunted with dogs, but he is more commonly shot with arrows, or taken in snares. He feeds in the same manner as the stag and fallow-deer, and lives to a great age. *La Venerie de Jacques Dufouilloux.*

of the ice on the Seine perfectly resembles what the Canadians say of the ice on the rivers of Quebec. Gaul, under the same latitude as Canada, was, two thousand years ago, what Canada is at present; that is to say, a climate cold enough for these animals to live in, which are now only to be met with in the regions of the north.

By comparing and combining the above testimonies, it appears to me, that the forests of Gaul and Germany were stocked with elks and rein deer, and that the passages in Cæsar's Commentaries, can only be applied to those two animals. As the land was cultivated, and the waters became gradually dried up, the temperature of the climate became more mild, and those animals, who delight in cold, immediately abandoned the flat countries, and retired into the snowy region, where they lived in the time of Gaston de Foix; and if they are no longer to be found there, it is because this temperature has been ever since increasing in heat by the almost entire destruction of the forests, by the successive lowering of the mountains, the diminution of the waters, the multiplication of mankind, and by the continual increase of culture, and every other improvement. I am likewise of opinion that Pliny has borrowed from Cæsar almost all he has written of these two animals, and that he was the first author of the confusion in their names. He mentions at the same time the *alce* and the *machlis*, from which we ought naturally to conclude, that these two names mean two different animals: however, if we remark, 1. That he only simply names the alce without any description whatever. 2. That he alone has used the name *machlis*, which word is not to be found in either Greek or Latin, but appears to be coined, and which, according to Pliny's commentators, is changed into that of *alce* in many ancient manuscripts. 3. That he attributes to the machlis all what Julius Cæsar gives to the alce; we cannot doubt but the passage in Pliny is corrupted, and that these two names mean the same animal, namely, the elk. This question once decided will also decide another. The *machlis* being the *elk*, the *tarandus* must be the *rein-deer*. This name of *tarandus* is not to be found in any author before Pliny, and in the interpretation of which, authors have greatly varied; however, Agricola and Elliot have not hesitated to apply it to the rein-deer; and for the reasons just deduced, we subscribe to their opinion. Besides, we must not be surprised at the silence of the Greeks on the subject of these two animals, nor at the ambiguity with which the Latins have spoken of them, since the northern climates were absolutely strangers to the first, and only known to the second by relation.

The elk is only found on this, and the rein-deer on the other, side of the polar circle in Europe and in Asia. We find them in America, in the lower latitudes, because the cold is greater there than in Europe. The rein-deer can bear the most excessive cold; he is found in Spitsbergen; he is common in Greenland, and in the most northern parts of Lapland and Asia. The elk does not approach so near the pole; he inhabits Norway, Sweden, Poland, Lithuania, Russia, and all the provinces of Siberia and Tartary, even to the north of China. We meet with him under the name of *Orignal*, and the rein-deer under that of *Caribou* in Canada, and in all the northern parts of America. Those naturalists, who doubted whether the Orignal was the elk, and the Caribou the rein-deer, had not compared Nature with the testimonies of travellers. These are certainly the same animals, though like all the rest in the New Continent smaller than those in the Old.

We may form a more perfect idea of the

elk and rein-deer, by comparing them with the stag; the elk is taller, thicker, and stands more erect upon his legs; his neck is shorter, his hair longer, and his antlers wider and heavier than those of the stag. The rein-deer is shorter, his legs are smaller and thicker, and his feet much larger; his hair is very thickly furnished, and his horns much longer and divided into a great number of branches, with flat terminations; while those of the elk appear to have been cut or broached at the edges. Both have long hair under the neck, short tails, and ears much longer than those of the stag; they do not leap nor bound like the roe-buck, but their pace is a kind of trot, so easy and quick, that they go over almost as much ground in the same time, without being in the least fatigued; for they will sometimes continue their trot for two days together, without resting. The rein-deer lives upon the mountains; and the elk dwells in low lands and damp forests; both go in herds like the stags, and both can be tamed, but the rein-deer with greater ease than the elk. The last, like the stag, has never lost his liberty, while the rein-deer has been rendered domestic by the most unenlightened part of mankind. The Laplanders have no other cattle. In this icy climate, which receives only the oblique rays of the sun, where the night and the day comprehend two seasons; where the snow covers the earth from the beginning of autumn to the end of spring, and where the verdure of the summer consists in the bramble, juniper, and moss, where could man expect to procure necessary nourishment for cattle? The horse, the ox, the sheep, and all the other useful animals, could not find subsistence there, nor resist the rigour of the cold; it was therefore necessary to search among the inhabitants of the forest for the least wild and profitable animals; the Laplanders have done what we should be obliged to do ourselves if we were to lose our cattle; we should then be forced to tame the stags, and the roebucks of our forests to supply their place; this I am persuaded, we should easily accomplish, and soon derive as much advantage from them as the Laplanders do from their rein-deer. This example ought to make us sensible how far Nature has extended her liberality towards us; we do not make use of one half her treasure, for her bounty is more immeasurable than we can imagine; she has bestowed on us the horse, the ox, the sheep, and all other domestic animals, to serve, to feed, and clothe us; and she has other species in reserve, which would ably supply the deficiency, and which only require us to subdue, and make them useful to our wants. Man is not acquainted with the powers of Nature, nor how far her productions are to be improved by the exertions of his capacity; instead of exploring her unknown treasures, he is constantly abusing those with which he is acquainted.

By comparing the advantages which the Laplanders derive from the rein-deer with those we experience from our domestic animals, we shall see that he is worth two or three of them. He is used as a horse to draw sledges and carriages; he travels with great speed and swiftness, travelling thirty leagues a day with ease, and runs with as much certainty on frozen snows as upon the mossy down. The female affords milk more substantial and nourishing than that of the cow. The flesh is excellent food. His hair makes an exceeding good fur, and his hide makes a very supple and durable leather. Thus the rein-deer alone affords all that we derive from the horse, the ox, and the sheep.

The manner in which the Laplanders rear and train these animals deserves our particular attention. Olaus, Schæffer, and Regnard, have given interesting details on this subject, of which the following is an abstract: The horns of the rein-deer, say these authors, are larger and divided into a greater number of branches than those of the stag. The food of this animal, in the winter season, is a white moss, which he finds under the deepest snow, and which he ploughs up with his horns, or digs up with his feet. In summer he lives upon the buds and leaves of trees in preference to herbs, which his forward spreading horns will not permit him to brouze on with facility. He runs upon the snow and sinks but little, by reason of his broad feet. These animals are very mild, and are kept in herds, which turn out greatly to the profit of their owners; the milk, hide, sinews, bones, hoofs, horns, hair, and the flesh, are all useful and good. The richest Laplanders have herds of four or five hundred, and the poorest have ten or twelve. They are led out to pasture, and shut up in inclosures during the night, to shelter them from the outrages of the wolves. If taken to another climate they die in a short time. Many centuries since, Steno, prince of Sweden, sent six to Frederic, duke of Holstein; and more recently, in 1533, Gustavus, king of Sweden, sent ten over to Prussia, both males and females; but they all perished, without

out producing either in a domestic or free state. "I would fain (says M. Regnard) have brought some rein-deer alive into France; many persons have in vain attempted it, and last year three or four were conducted to Dantzic, where they soon died, not being able to bear the heat of that climate."

There are both wild and tame rein-deer in Lapland. In the rutting season the females are let loose to seek the wild males in the woods; and as these wild males are more robust, and stronger than the domestic ones, the breed from this mixture are preferred for harness. These rein-deer are not so gentle as the others, for they not only sometimes refuse to obey those who guide them, but often turn and furiously attack them with their feet, so that they have no other resource than to cover themselves with the sledge until the fury of the beast is subsided. This sledge is so light that the Laplander can with ease turn it over himself; the bottom of it is covered with the skins of young rein-deers, the hair of which is turned backwards, so that the sledge glides easily forwards, and is prevented from recoiling on the mountains. The harness of the rein-deer is only a collar made of the skin, with the hairs remaining on it, from whence a trace is brought under the belly, between the legs, and fastened to the fore part of the sledge. The Laplander has only a single cord, as a rein, fastened to the animal's horn, which he throws sometimes on one side and sometimes on the other of the beast, according as he would direct him to the right or left. They can travel four or five leagues an hour; but the quicker he goes the more inconvenient is the motion, and a person must be well accustomed, and travel often, to be able to sit in the sledge, and prevent it from turning over.

The rein-deer have outwardly many things in common with the stag, and the formation of their interior parts is nearly the same. From this conformity of Nature, analogous customs and similar effects result. The rein-deer sheds his horns every year like the stag, and, like him, makes very good venison. The rutting season of both is towards the end of September. The females of both species go eight months with young, and produce but one at a birth. The males have the same disgustful smell in their rutting time; and among the female rein-deer there are also found some who are barren. The young rein-deer, like the young fawns of the stag, are variously coloured; it is at first of a reddish colour, and becomes, as they grow old, almost of an entire brown. The young follow their mothers two or three years, and they do not attain their full growth till the age of four; it is at this age that they begin to dress and exercise them for labour. In order to render them more manageable they are castrated when young, which operation the Laplanders perform with their teeth. The uncastrated males are very difficult to manage, and they therefore make use only of those which are gelded, among which they choose the most lively and nimble to draw their sledges, and the more heavy to carry their provisions and baggage. They keep only one stallion rein-deer for five or six females. These animals are troubled with an insect, called the gad-fly, who burrowing under their skins deposit their eggs, so that sometimes by the end of winter the worms that proceed from them render their skins as full of holes as a sieve.

The herds of rein-deer require a great deal of care; they are subject to elope, and voluntarily strive to regain their natural liberty: they must be closely attended, and narrowly watched, and never led to pasture but in open places; and in case the herd is numerous they have need of many persons to keep them together,

gether, and to run after those which attempt to stray. They are all marked, that they may be known again, for it often happens that they stray in the woods, or mix with other herds. In short, the Laplanders are continually occupied in the care of their rein-deer, which constitute all their wealth, and they know well how to procure every convenience, or, more properly, all the necessities of life, from these animals. In the winter season they cloath themselves from head to foot with the furs of the rein-deer, which are impenetrable to frost or rain; and in summer they make use of the hides from which the fur has fallen off. They also spin the hair, and cover the sinews which they take from the body of the dead animal, for cordage and thread. They eat the flesh, drink the milk, and of the latter they also make very rich cheese. This milk, when churned, gives, instead of butter, a kind of suet. This particularly, as well as the largeness of the horns, and the plenty of fat he affords at the beginning of the rutting season, are so many proofs of the superabundance of nourishment; and what still more strongly proves his superabundance to be excessive, or at least greater than any other species, is, that the rein-deer is the only animal where the female has horns as well as the male, and this last is the only one also who sheds his horns and renews them even when castrated. For in stags, fallow-deer, and roe-bucks, who have undergone this operation, the horns of the animal remain always in the same state they were at the moment of castration. Thus the rein-deer is, of all animals, that in which the superfluity of nutritive matter is the most apparent, and this, perhaps, is less owing to the nature of the animal than to the quality of its food, for the white moss, which is his only aliment during the winter, is a *lichen*, whose substance resembles that of the mushroom; it is very nourishing, and is more loaded with organic molecules, than the leaves or buds of trees, and it is for this reason that the rein-deer has larger horns, and affords more fat than the stag; and that the females, and those that are castrated, are not deprived of horns: it is the cause also of the great variety that is found in the size of the horns, and of the figure and number of the branches, beyond what is possessed by any other of the deer kind. The males who had been neither hunted nor confined, and who feed amply, and at pleasure, on this substantial aliment, have prodigious large horns, which extend backward as far as the crupper, and forwards beyond the muzzle. Those which are gelded have smaller horns, yet much larger than the stag, and those of the females are still less. Thus the horns of the rein-deer, differ not only, like others, according to age, but also according to sex and castration. The horns, therefore, are so exceedingly different in individuals, that it is not to be wondered at that authors have differed so much upon this subject.

Another singularity, which is common to the rein-deer and the elk, we must not omit. When these animals run, their hoofs at every step make a crackling noise, as if all their limbs were disjointed; and it is this noise, or perhaps the scent, which informs the wolves of their approach, who way-lay them, and if the wolves are many in number, they will attack and kill him; for the rein-deer is able to defend himself against a single wolf, not, as may be imagined, with his horns, for they are rather of disservice than of use, but with his fore-feet, which are very strong, and with which he strikes the wolf with such force, as to stun, or drive him away; after which he flies with such speed as to be no longer in danger of being overtaken. He has a more dangerous, though a less numerous, and a less frequent enemy, in the *rosomack*, or *glutton* ; this animal is more voracious, but heavier than the wolf; he does not pursue the rein-deer, but conceals himself in a tree, and waits the arrival of his prey ; as soon as the rein-deer comes within his reach, he darts upon him, fastens himself with his nails upon his back, and tearing his head or neck with his teeth, never quits his place till he has killed him. He makes the like attacks, and uses the stratagems to conquer the elk, who is stronger than the rein-deer. This *rosamach*, or *glutton* of the north, is the same animal as the *carcajou* or *quincajou*, of North America ; his battles with the *orignal* are celebrated ; and, as we have formerly said, the *orignal* of Canada is the same as the elk of Europe. It is singular, that this animal, who is scarce bigger than a badger, is able to conquer an elk, whose size exceeds that of a horse, and whose strength is so great, that with a single stroke of his foot he can kill a wolf. But it is attested by so many authorities, that we cannot have the least doubt of its being the fact.

The elk and rein-deer are both ruminating animals, as their method of feeding, and the formation of their interior parts demonstrate ; nevertheless, Tornæus Scheffer, Regnard, Hulden, and others, have affirmed, that the rein-deer does not ruminate. Ray justly declares this to be incredible ; and, in fact, the rein-deer does ruminate like every other animal who has many stomachs. A domestic rein-deer does not live more than fifteen or sixteen years, but it must be presumed, that his life is of a longer duration in a wild state; for this animal being four years before he arrives at his full growth, ought to live twenty-eight or thirty years when in his natural state. The Laplanders hunt the wild rein-deers by different methods, according to the difference of seasons. In the rutting season they make use of their domestic females to attract the wild males. They shoot them with the musket, or with the bow, and they deliver their arrows with such strength, that notwithstanding the thickness of their hair and hide, they often kill one of these beasts with a single arrow.

We have collected the facts in the history of the rein-deer with the greater care and circumspection, because we could not acquire personal information on the subject, as it is impossible to keep such an animal alive in these parts. Having mentioned my regret on this subject to some of my friends, Mr. Colinson, Member of the Royal Society in London, a gentleman as commendable for his virtues, as for his literary merit, was so kind as to send me over the skeleton of a rein-deer, and I received from Canada the fœtus of a caribou. By means of these two species, and of several horns which were brought to me from different places, I have been enabled to verify the general resemblances, and the principal differences between the rein-deer and the stag.

With respect to the elk, I saw a living one about fifteen years ago; but as he continued only a few days in Paris, I had not time to have a drawing finished; and that was the only one by which I had an opportunity to verify the description which the gentlemen of the Academy of Sciences had formerly given of this animal, and to assure myself that it was exact, and perfectly conformable to Nature.*

" The elk (says the compiler of the Memoirs of the Academy) is remarkable for the length of his hair, the bigness of his ears, the smallness of his tail, and the form of his eye, the great angle of which is very wide, as well as the mouth, which is much larger than that of oxen, stags, or other animals who have cloven feet. The elk which we dissected was nearly of the size of a stag. The length of his body was five feet and a half, from the end of the muzzle to the beginning of the tail, which is only two inches long; as it was of a female, the head had no horns; and the neck was only nine inches long and nearly of the same breadth. The ears were nine inches long, and four wide. The colour of the hair was not much unlike that of the ass, the grey tinge of which sometimes approaches that of the camel; but it differed in other respects, for it was shorter, and from that of the camel, which is much finer. The length of the hair was three inches, and its thickness equalled that of the largest mane of a horse; this thickness gradually diminished towards the extremity which was very pointed; towards the root it also diminished, but, all of a sudden, grew thicker again; and this end was of a different colour from the rest of the hair, being white and diaphanous, like the bristles of a hog. The hair was as long as that of a bear, but straighter, thicker, flatter, and all of the same kind. The upper lip was large and loosened from the gums, but not so large as Solinus has described it, nor as Pliny has given to the animal which he terms *machlis*. These authors say, that this beast is constrained to go backwards when he is at pasture to prevent his lip from entangling between his teeth. We observed in the dissection, that Nature had provided against this inconvenience by the size and strength of the muscles, destined to elevate the upper lip. We also found the articulations of the leg very strongly bound together by ligaments, whose firmness and thickness might have given rise to the opinion that the *alce* was not able to raise himself up when once he was down. His feet were like those of the stag, having no peculiarity except that of being larger. We have observed, that the great angle of the eye was slit downwards much more than in the stag, fallow-deer, and roe-buck, but this slit was not in the direction of the opening of the eye, but made an angle with the line which goes from one corner of the eye to the other; the inferior lachrymal gland was an inch and a half long. We found a part in the brain, which, from its size, seemed to point out a connection with that of the smell, which, according to Pausanias, is more exquisite in the elk, than in any other animal; for the olfactory nerves, commonly called the *namillary nocesses*, were without comparison larger than in any other animal we ever dissected. As for the bit of flesh which some authors have placed upon his back, and others under his chin, if they have not been deceived, or have not been too credulous, those things were peculiar to those elks of which they have spoken."

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* With respect to the figures of animals, we have in all cases endeavoured to be more correct than the French edition, by the addition of many original figures accurately studied from the life, and whenever living subjects could not be obtained, by comparing those drawings with preserved figures in different cabinets, by which means we have been enabled to remedy several defects; and in no one more so than in our figure of the *Elk.*

We can add our own testimony to that of the gentlemen of the Academy, for in the female elk, which we saw alive, there was no bunch either under the chin or on the neck; nevertheless, Linnæus, who ought to be acquainted with elks better than we can pretend to be, as he lives in the same country, makes mention of this bunch, and has even given it as an essential character of the elk: *Alces cervus cornibus a caulibus palmatis caruncula gutturali.* Linnæus, Syst. Nat. Edit. X. p. 66. ---There is no other method of reconciling this assertion of Linnæus, with our negation, than by supposing this bunch, or *guttural caruncula*, to belong to the male elk which we have not seen. But if that be the case, this author should not have made it an essential character of the species, since the female has it not; perhaps also, this bunch is only a common disorder among the elks, a kind of wen; for in the two figures of this animal, given by Gesner, the first, who has no horns, has a thick caruncula under the neck; and in the second, which represents a male elk with horns, there is no caruncula.

In general the elk is much larger and stronger than the stag or rein-deer. His hair is so rough, and his hide so hard, that a musket ball can scarcely penetrate it. His legs are very firm, with so much agility and strength, especially in the fore feet, that he can kill a man or a wolf, and even break a tree by one single stroke with his foot. Nevertheless, he is hunted nearly as we hunt the stag, with men and dogs. It is affirmed, that when he is pursued he often falls down all at once, without being either shot or wounded. From this circumstance some have presumed that this animal was subject to the epilepsy, and on this presumption (which is not well founded, since fear alone might produce the same effect) this absurd conclusion has been drawn, that his hoof is a remedy for the epilepsy, and even a preventative against it; and this ridiculous opinion has been so universally dispersed, that many people still wear rings, the collet of which incloses a small piece of the hoof of an elk.

As there are but few people in the northern parts of America, all animals, and particularly elks, are in greater numbers there than in the north of Europe. The savages are not ignorant of the art of hunting and taking the elks; they follow them by the track of their feet, and very often for many days together, and by address and perseverance they often gain their end. Their method of hunting them in winter is particularly singular. "They make use of rackets (says Denys), by means of which they walk on the snow without sinking. The *orignal* does not get forward very fast, because his sinking in the snow greatly fatigues him. He eats nothing but the young shoots of the trees, therefore, where the savages find the trees eaten, they presently meet with the animals, which are never far off, and which they approach very easily. They throw darts at them, which are large clubs, having at the end a large pointed bone, which pierces like a sword. If there be many orignals in one troop the savages put them to flight, for then the orignals, placing themselves in a rank, describe a large circle, sometimes more than two leagues, and which, by frequently traversing, they harden so much with their feet that they no longer sink in. The savages wait for and kill them as they pass, with their darts." In comparing this relation with those we have already quoted, we find, that the savage and the *orig-*

nal of America, are exact copies of the Laplander and elk of Europe.

SUPPLEMENT.

M. ALLEMAND, in his edition, has added some remarks respecting the elk and rein-deer, and, among them, says, that M. de Buffon appears to be warranted in the opinion that the elk of Europe is the orignal of North America, and that the only difference between them is in the size; but that most travellers differ from M. de Buffon's general conclusion, that the latter is the largest. Mr. Dudley, in particular, has described an *orignal* to the Royal Society, which had been killed by some hunters, that was more than ten feet high; a stature requisite to carry the horns which La Hontan has affirmed to weigh from three to four hundred pounds.

The duke of Richmond had a female orignal in his park, in the year 1766, which he received as a present from General Carleton, then governor of Canada; it was not more than a twelvemonth old, and was about five feet in height; its back and thighs were of a deep brown, and the belly much lighter; but this animal did not live more than nine or ten months. M. Allemand says, that he received the head of a female orignal from Canada, which was much larger, as it measured, from the end of the muzzle to the ears, two feet three inches, was two feet eight inches round at the ears, and one foot ten inches near the mouth, and its ears were nine inches long; this head being dried was consequently less in its dimensions than when the animal was alive.

In the same manner this gentleman considers M. de Buffon's opinion, that the caribou of America is the same animal as the rein-deer of Lapland, and he is induced so to do by comparing the drawing of the rein-deer (taken from life by Ridinger) with that of the drawing of an American caribou, sent him by the Duke of Richmond, who had kept one of those animals a considerable time in his park.

To the remarks already given concerning the rein-deer, there is little to add, yet the opportunity must be embraced of giving the figure (*fig.* 150.) of a female, drawn from life while in the possession of the Prince of

Condé; he received it from the King of Sweden, who also sent him two males, one of which died on his way, and the other almost as soon as he arrived in France. This animal was about the size of a hind, though her legs were somewhat shorter, and in her body she was more bulky. She had also horns like the male, but shorter, and which were separated into antlers, some of them pointing forwards, and others bent backwards. M. de Seve gave me a very particular description of this animal; he said, the length of the body, from the muzzle to the crupper, was five feet one inch; the height of the withers, two feet eleven inches, and nine lines more at the crupper; the hair was very close, about an inch long on the body, longer on the belly, and very short on the legs; upon the body it was a reddish brown, intermixed in some places with a yellowish white, being of a deeper colour on part of the back, on the thighs, on the top of the head, and on the eye-pits; round the eyes and nostrils were black; the point of the muzzle white; the ears, over which the hair was thick, a yellowish white mixed with brown, the inside of them had long white hairs; the neck, and the long hairs below the breast, and upon the upper part of the back, were of a yellowish white; the legs and thighs were of a deep brown, and of a greyish white on the insides, of which colour were also the hairs which covered the hoofs; the feet were cloven; the two fore toes being broader than the hind ones; they were all very thin, and extremely black.

No conclusion must be drawn as to the size of the rein-deer's horns from the figure we have given, as some of them have horns so enormous as to reach back to their cruppers, at the same time branching out above a foot in the front. There can be little doubt but the large fossil horns found in Ireland have belonged to a species of the rein-deer, and of which Mr. Collinson informed me that he had seen some which had an interval of ten feet between their extremities; it must be to this species and not to the elk which the fossil bones of the animal, called mouse-deer, must be attributed. But it must be admitted, that there do not at present exist any rein-deer of sufficient size and strength to carry horns of that magnitude as are found in a fossil state in Ireland, in many parts of Europe, and even in North America. I have lately been informed there are two kinds of the rein-deer, the one considerably larger than the other, of which I was not acquainted when I gave my former description; the one I referred to, and compared to the caribou of America, and the Greenland fallow deer, was of the small sort.

It has been asserted by some travellers, that the rein-deer is the fallow-deer of the north; while Pontoppidan says the rein-deer is not able to exist but in the northern regions, and even there they are obliged to dwell on the tops of the highest mountains; this author also asserts that their horns are moveable, that they can turn them about at pleasure, and that over the eyelids they have an opening in the skin, through which they see, when the glare of the snow prevents them from opening their eyes.

Upon almost the slightest motion these animals make a crackling noise; when running, touched, or even surprised, this noise is heard. I have been informed it is the same with the elk but I cannot ascertain it as the fact.

THE WILD, CHAMOIS, AND OTHER GOATS.

ALTHOUGH it appears that the Greeks were acquainted with the wild and chamois goats yet they have not described them by any particular denomination, nor even by characters sufficiently exact by which to distinguish them; they have only mentioned them under the general name of *Wild Goats*. They probably presumed, that these animals were of the same species as the domestic goats, never having given them proper names, as they have done to every other species of quadrupeds. On the contrary, our modern naturalists have regarded the wild and chamois goats as two real and distinct species, and both different from that of the common goat. There are facts and reasons for and against both opinions, of which we shall give a detail, and wait until it be ascertained whether they intermix together and produce fertile individuals, experience having taught us, that this is the sole criterion on which can the question be decided.

The male wild goat differs from the chamois, by the length, thickness, and form of

his

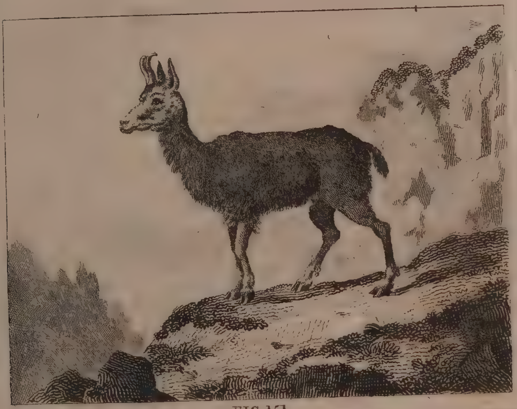

FIG. 151

Chamois Goat

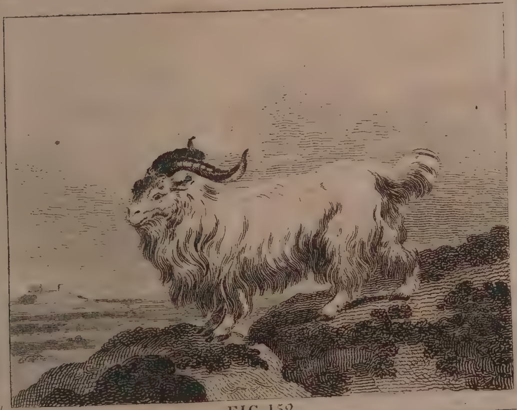

FIG. 152

Buck of Juda

his horns; he is also more bulky, vigorous, and stronger. The female wild goat has smaller horns than the male, and nearly resembling those of the chamois. In other respects, these two animals have the same customs, the same manners, and inhabit the same climate; only the wild goat being more agile, and stronger, climbs to the summits of the highest mountains, while the chamois never goes higher than the second stage; but neither of them are to be found in the plains: both clear their way in the snow, and both bound from one rock to another. Both are covered with a firm solid skin, and cloathed in winter with a double fur, with very rough hair outwardly, and a more fine and thicker underneath. Both of them have a black stripe on the back, and tails nearly of the same size. The number of exterior resemblances in fact is so great, and the conformity of the exterior parts is so complete, that we might be led to believe these two animals were only simple varieties of the same species. The wild, as well as the chamois goats when taken young, and brought up with domestic goats, are easily tamed, imbibe the same manners, herd together, return to the same fold, and probably, copulate and produce together. But this last fact, the most important of all, and which alone would decide the question,

tion, is not ascertained.* We have never learnt for a certainty whether the wild and the chamois copulate with our goats; we only suppose it, and in this respect agree with the ancients. But our presumption appears founded upon those analogies which experience has seldom contradicted.

Let us, nevertheless, take a view of the reasons against it. The wild and chamois goats both subsist in a state of nature, and both are constantly distinct. The chamois sometimes comes of his own accord and joins the flock of our domestic kind, but the wild goat never associates with them, at least before he is tamed. The male wild goat and the common he-goat have very long beards and the chamois has none. The male and female chamois have very small horns: those of the male wild goat are so thick and so long, that they would scarcely be imagined to belong to an animal of his size. The chamois also appears to differ from the wild goat and the common he-goat, he-goat, by the direction of his horns, which are inclined a little forwards in their lower parts, and bent backwards at the point in the form of a hook; but, as we have already remarked, in speaking of oxen and sheep, the horns of domestic animals vary prodigiously, as do also those of wild animals, according to the differences of climate. Our female goats have not their horns absolutely resembling those of the male. The horns of the male wild goat are not very different from those of our he-goat; and as the female wild goat approaches the domestic kind, and even the chamois, in size and smallness of the horns, may we not conclude, that the wild, the chamois, and the domestic goat, are, in fact, but one species, in which the nature of the females is invariably alike, while the males are subject to variations? In this point of view, which, perhaps, is not so distinct from Nature as might be imagined, the wild goat would be the male in the original race of goats, and the chamois the female. This is not imaginary, since we can prove by experience, that there are in Nature, animals where the females will equally serve the males of different species, and produce young from both. The sheep produces with the he-goat as well as with the ram, and always brings forth lambs of its own species: the ram, on the contrary, does not copulate with the she-goat. We may, therefore, look upon the sheep as a female common to two different males, and consequently, constitutes a species independent of the male. It may be the same in that of the wild goat; the female alone represents the primitive species, because her nature is constant: the males, on the contrary, vary, and there is a great appearance that the domestic she-goat, which may be considered as the same female as the chamois and the wild kind, would produce with these three different males, which alone make the variety in the species, and consequently do not alter the identity, although they appear to change the unity of it.

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* Sonnini has an important fact upon this subject. He says that M. Berthoud van Berchem saw mongrels which proceeded from the copulation of a wild goat brought up at Aigle in the Lower Vallais, in the house of the governor of Vatteville, with many domestic goats. All the inhabitants of the town of Aigle were witnesses of this fact.

These, like most other possible accounts, must be found in Nature; it even appears, that the females in general contribute more to the support of the species than the males; for though both concur in the first formation of the fœtus, the female, who afterwards alone furnishes all that is necessary to its growth and nutrition, modifies and assimilates it more to her own nature, which cannot fail of effacing the impression of the parts derived from the male. Thus, if we would judge deliberately and rationally of a species, the females should be the objects examined. The male gives half of the living substance, the female gives as much, and furnishes besides all the necessary matter for its formation. A handsome woman has almost always fine children; a handsome man with an ugly woman, commonly has children who are still more ugly.

Thus, in the same species, there may sometimes be two races, the one masculine, and the other feminine, both of which subsisting and perpetuating their distinctive characters, seem to constitute two different species; and this is the point where it appears almost impossible to fix the term between what naturalists call *species* and *variety*. Suppose, for example, we should constantly couple he-goats with some sheep, and rams with others; it is evident, that after a certain number of generations, there would be established in the species of the sheep, a breed which would tend greatly towards the goat, and would afterwards perpetuate itself; for, though the first produce with the he-goat would be very little removed from the species of the mother, and would be a lamb and not a kid, nevertheless this lamb would have hair, and some other characteristics of its father. If we afterwards couple the he-goat with these female bastards, the production of this second generation will approach nearer to the species of the father, still nearer in the third, and so on. By this method the adventitious characters would soon prevail over the natural ones, and this fictitious breed might support itself, and form a variety in the species, whose origin it would be very difficult to recognize; therefore what can be done by the influence of the one species on another, may still be more effectually produced by the same species. If strong females have continually only weak males, in course of time, a feminine race will be established; and if very strong males are put to females of inferior strength and vigour, a masculine race will be the result, and will appear so different from the first, as hardly to be allowed to have one common origin, and which consequently will be regarded as really distinct and separate species.

To these general reflections, we shall add some particular observations. Linnæus speaks of two animals which he had seen in Holland, that were of the goat kind; the horns of the first were short, almost resting upon the skull, and its hair was long; the second had erect horns, the points turned back, and the hair short. These animals, which appeared to be more

distant

in species than the chamois and the common goat, nevertheless produced together, which sufficiently demonstrates that these differences in the shape of the horns, and length of the hair, are not specific and essential characters; for as these animals produced together, they must be regarded as the same species. From this example we may draw a very probable induction, that the chamois and our goat, whose principal differences consist in the shape of the horns and the length of the hair, are probably one and the same species.

In the royal cabinet there is a skeleton of an animal which was given to the menagerie under the name of *capricorne* ; it perfectly resembles the domestic goat in the make of the body and the proportion of the bones, and in the form of the lower jaw, that of the wild-goat; but he differs from both in the horns ; those of the wild-goat have prominent tubercles, and two longitudinal ridges ; those of the common he-goat have but one ridge, and no turbercles, the horns of the capricorne have but one ridge and no tubercles, but only rugosities which are larger than those of the goat ; these differences indicate, therefore, an intermediate race between the wild and the domestic goat. The horns of the capricorne are also short and crooked at the point, like those of the chamois, and, at the same time, they are compressed, and have rings; thus they partake at once of the common goat, the wild goat, and the chamois goat.

Mr. Brown, in his History of Jamaica, relates, that in that island there is actually to be found, 1. The common domestic goat of Europe; 2. The chamois; and 3. The wild goat. He affirms, that neither of these three animals are natives of America, but have been transported from Europe; that they have, like the sheep, degenerated and become smaller in this new country; that the wool of the sheep is changed into a rough hair like that of the goat; that the wild goat appears to be a bastard race, &c. From this we are induced to suppose that the small goat, with erect horns and crooked at the points, which Linnæus saw in Holland, and was said to come from America, is the chamois of Jamaica, that is, the chamois of Europe degenerated, and become less by the climate of America; and that the wild goat of Jamacia, which Mr. Brown calls the bastard wild goat, is our capricorne, which appears to be only a wild goat degenerated, and whose horns might have varied by the influence of the climate.

M. Daubenton, after having scrupulously examined the affinities of the chamois with those of the he-goat and the ram, says, that in general, it resembles more the first than the last; the principal differences besides the horns are the form and size of the forehead, which is less elevated and shorter in the chamois than in the goat, and the form of the nose, which is more contracted ; so that in these two, the chamois bears a greater resemblance to the ram than to the goat. But supposing, for which there is much reason, that the chamois is a constant variety of the species of the he-goat, as the bull-dog and greyhound are fixed varieties in the species of the dog, we shall see that these differences in the size of the forehead and the position of the nose, are not nearly so great in the chamois, relatively to the goat, as in the bull-dog relative to the greyhound, which, nevertheless produce together, and are certainly of the same species. In other respects, as the chamois resembles the goat by a greater number of characters than the ram, if it constitute a particular species, it must necessarily be an intermediate one betwixt the goat and the ram. We have observed, that the he-goat and the sheep produce together, therefore the chamois, which is an intermediate species between the two, and at the same time is much nearer the goat than the ram, by the number of resemblances, ought to copulate with the she-goat and consequently must not be considered but as a variety constant in this species.

As the chamois which was transported to and became less in America, produces with the small goat of Africa, there can be little doubt but he would also produce with the she-goats of the common kind. The chamois, therefore, is only a constant variety in the species of the goat, as the bull-dog is in that of the dog; and, on the other hand, we can scarcely question that the wild goat is the primitive goat in the state of nature and, is with respect to domestic goats, what the muflon is to the sheep. The wild goat exactly resembles the domestic he goat, in figure, conformation, and in natural and physical habits; it only varies by two slight differences the one exterior, the other interior; the horns of the wild goat are larger than those of the common he-goat the former having two longitudinal ridges, and the latter but one; they have also large transverse rings which mark the number of years of their growth, while those of the common he-goats are only marked with transverse strokes. The figure of their bodies is in other respects perfectly alike. The interior part is also similar, excepting the spleen, which is oval in the wild goat, and approaches nearer to that of the roe-buck, or stag than that of the he-goat, or ram. This last difference may proceed from the violent exercise of this animal. The wild goat runs as fast as the stag, and leaps lighter than the roe-buck; the spleen, therefore, ought to be made like that of the swiftest running animals. This difference, then, is owing less to Nature than to custom, and it is to be presumed, that if our domestic he-goats were to become wild, and were forced to run and to leap like the wild goats, the spleen would soon assume the form most convenient to this exercise. With respect to his horns, the differences, though very apparent, do not prevent their more resembling those of the he-goat than of any other animal. Thus the wild and common he-goat approaching nearer to each other than to any other animal, even in this part, which is the most different of all, we must conclude, as they are alike in every other particular, that, notwithstanding this slight and single disagreement, they both are animals of the same species.

I consider, therefore, the wild, the chamois, and the domestic goat, as one species, in which the males have undergone greater varieties than the females; and I find, at the same time, secondary varieties in the domestic kind, which are less equivocal, as they belong equally to the males and females. We have seen that the goats of Angora, though very different from ours, in the hair and horns, are, nevertheless, of the same species. The same may be said of the Juda goat, which Linnæus with much reason has considered as a variety of the domestic species. This goat, which is common in Guinea, Angola, and other parts of Africa, differs from ours only in being smaller, fatter, and more squat; his flesh is also better, and preferred in that country to mutton, as we prefer the flesh of the sheep to that of the goat. It is the same with the Levant, or Mambrina goat,* with long hanging ears; which is only a variety of the goat of Angora, who has also hanging ears, but not so long. The ancients were acquainted with these goats, but they did not separate them from the common species. The variety of the Mambrina goat is more diffused than that of the goat of Angora; for we find these very long-eared goats in Egypt, and the East Indies, as well as in Syria; they give plenty of good milk, and which the eastern nations prefer to that of the cow, or female buffalo.

With respect to the small goat that Linnæus saw alive, and which produced with the American chamois, it must have, as we observed, been originally transported from Africa; for it so greatly resembles the African he-goat, that we cannot doubt of its being of the same species, or that it, at least, owes its first origin to it. This goat is small in Africa, and would become still less in America; and we know, by the testimony of travellers, that it has for a long time been as customary to transport from Africa, as from Europe into America, sheep, hogs, and goats, whose races still subsist without any other alteration than a diminution in the size.

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* The name of Mambrina goat arises from this animal being common on the mountain of Mambre or Mamre, situated in the southern part of Palestine, near the environs of Herbron. It is the only sort which is diffused over Lower Egypt. It is said that its ears are so long that they drag them on the ground, and that the Orientalists cut one of them that the animal may feed: but this is an exaggeration and an error; the ears do not trail upon the ground, neither are they cut.

After having examined the different varieties of goats, and considered them relatively to each other, it appears to me, that of the nine or ten species of which the nomenclators speak, there is, in reality, but one; for instance, 1. The wild he-goat is the principal stock of the species. 2. The capricorne is the wild goat degenerated by the influence of climate. 3. The domestic he-goat derives his origin from the wild he-goat. 4. The chamois is only a variety in the species of the she-goat, with whom he would be able to produce as well as the wild goat. 5. The small goat with erect horns, crooked at the points, which Linnæus speaks of, is the chamois of Europe become smaller in America. 6. The other small goat with horns lying flat, and which produced with the small chamois of America, is the same as the he-goat of Africa, and the production of these two animals prove, that our chamois and domestic he-goat would also produce together, and are, consequently, of the same species. 7. The dwarf goat, which is probably the female of the African buck, and, like the male, only a variety of the common kind. 8. It is the same with the bucks and she-goats of Juda, they are only varieties of our domestic goats. 9. The goat of Angora is also of the same species, since it produces with our goats. 10. The Membrina goat, with large pendulous ears, is a variety in the race of the goats of Angora. These ten animals, therefore, are only ten different races of one species, produced by the difference of climate. *Capræ in multos similitudines, transfigurantur*, says Pliny; and in effect, we see by this enumeration, that the goats, although essentially like each other, yet vary much in their external form; and if we should comprehend, with Pliny. under the generic name of Goats, not only all those we have mentioned but also the roe-buck, the gazelle, the antelope, &c. this would be the most extended species in Nature, and contains more kinds and varieties than that of the dog. But Pliny was not sufficiently informed of the real differences of species when he joined the roe-buck, antelope, &c. to the species of the goat. These animals, though bearing much resemblance to the goat in many respects, yet are different species; and we shall see, from the following articles, how much the antelopes vary, both in species and races; and after enumerating all the goats and all the antelopes we shall find many animals still remain, which participate of both. In the whole history of quadrupeds I find nothing more difficult to explain, nor more confused or uncertain, than the accounts given by travellers of goats, antelopes, and other species which have an affinity to them. I have exerted all my endeavours, and employed all my attention, to throw some light upon it, and shall not regret my labour, if what I now write may contribute to prevent errors, fix ideas, and bring forth the truth, by extending the views of those who would study Nature.——But to our subject.

All goats are liable to vertigos; this disease is also common to the wild and chamois goats, as well as the inclination to climb up rocks, and the custom of continually licking stones, especially those which are impregnated with nitre or salt. In the Alps are rocks which have been hollowed by the tongues of the chamois; these are commonly composed of soft and calcinable stones, in which there is always a certain quantity of nitre. These natural agreements, these conformable customs, appear to be sufficient indexes of the identity of species. The Greeks, as we have said, did not separate these into three different species; and our hunters, who, probably, never consulted the Greeks, have always looked upon them as the same species. Gaston Phœbus, when speaking of the wild goat, particularises him under the name of the wild buck; and the chamois, which he calls *ysarus* and *sarris*, is also, according to him, but another wild goat. I own that all these authorities do not make a complete proof, but by uniting them with the facts and reasons we have produced, they form such strong presumptions upon the unity of the species of these three animals, that we can harbour no doubt on the subject.

The wild and chamois goats, one of which I look upon as the male, and the other as the female stock of the goat kind, are only found, like the muflon, who is the stock of the sheep, in deserts, and in the most craggy and highest mountains. The Alps, the Pyrennees, the mountains of Greece, and those in the islands of the Archipelago, are almost the only places where the wild and the chamois goats are to be found. But although both dislike heat and inhabit the regions of snow and ice, yet they have also an aversion to excessive cold. In summer, they chuse the north side of the mountains; in winter they move to the southern and even descend from the summits. Neither can support themselves on their legs upon the ice when it is smooth, but if there be the least inequalities on its surface, they bound along with security.

The chace of these animals is very laborious, and dogs are almost useless in it. It is likewise very dangerous, for the animal finding himself hard pushed will turn and strike the hunter with his head, and sometimes throw him over a precipice. The chamois is as swift, though not so strong, as the wild goats; they are more numerous, and commonly go in herds; they are not, however, so numerous as they were formerly, at least in our Alpine and Pyrenean mountains.

M. Peroud, surveyor of the chrystal mines in the Alps, brought over a living chamois, and gave the following excellent information on the natural habits and manners of this animal.

mal. "The chamois is a wild animal, yet very docile; he inhabits only rocks and mountains. He is about the size of a domestic goat, and resembles him in many respects. He is most agreeably, lively, and active beyond expression. His hair is short like that of the doe; in spring it is of an ash-colour; in summer rather yellow; in autumn a deep yellow mixed with black, and in winter of a blackish brown. The chamois are found in great numbers in the mountains of Dauphiny, Piedmont, Savoy, Switzerland, and Germany: they live sociably together, and are found in flocks of from eight to fifteen or twenty, and sometimes they are seen to the number of from sixty to a hundred dispersed in small flocks upon the crags of a mountain. The large males keep separate from the rest, except in their rutting-time, when they approach the females. During this time they have a very strong smell; they bleat often and run from one mountain to another. The time of their coupling is from the beginning of October to the end of November, and they bring forth in March and April. The young female receives the male at a year and a half old. The young follow the dam for about five months, and sometimes longer, if the hunters, or the wolves, do not separate them. It is asserted that they live between twenty and thirty years. Their flesh is very good, and some of the fattest afford ten or twelve pounds of suet, which is better and harder than that of the goat. The blood of this animal is extremely hot, and is said to approach very nearly to that of the wild goat in its qualities and virtues, and may prove of the same service, for the effects are the same when taken in a double quantity: it is reckoned very good against pleurisies, a great purifier of the blood, and a restorative of perspiration. The hunters very often mix the blood of the wild and chamois goats together, and sometimes they sell the blood of the wild goat for that of the chamois. It is very difficult to distinguish the one from the other, which proves there can be but very little difference in them. The cry of the chamois is not distinct but faint, and resembling that of a hoarse domestic goat: it is by this cry they collect together, and by which the mother calls her young. But when they are frightened, or perceive an enemy, or any object which they cannot distinguish, they warn the rest of the flock by a kind of whistling noise. The chamois has a very penetrating sight, and his hearing and smell are not less discriminating. When he sees a man near he stops for a moment, and then flies off with the utmost speed. When the wind is in its favour he can smell a human creature for more than half a mile distance; therefore when he hears or scents any thing which he cannot see, he begins to whistle or blow with such force that the rocks and the forests re-echo the sound; if others are within hearing they are all alarmed; this whistling continues as long as the breath will permit: in the beginning it is very shrill, and deeper towards the close. The animal then rests a moment, after the alarm, to inspect farther into the danger, and having confirmed his suspicion, he commences his whistling, and continues it, by intervals, till it has spread the alarm to a great distance. During this time he is most violently agitated; he strikes the ground with his feet; he bounds from rock to rock; he turns and looks round; leaps from one precipice to another; and when he obtains a sight of his enemy he flies from it with all speed. The whistling of the male is more acute than that of the female: it is performed through the nostrils, and is no more than a very strong blowing, and resembles the noise which a man would make by fixing his tongue to the palate, keeping the teeth nearly shut, the lips open, and a little lengthened, and blowing with all his force. The chamois feeds on the best herbage, and chuses the most delicate part of plants, as the flowers and most tender buds. He is not less fond of several aromatic herbs, which grow upon the side of the Alps. He drinks very little while he feeds upon the succulent herbage. He ruminates like the common goat. The food he makes use of strongly marks the warmth of his constitution, as do his large eyes, which are admired for their roundness and sparkling, and the vivacity of his disposition. His head is crowned with two small horns, of about half a foot long; they are of a beautiful black, and rise from the forehead almost betwixt the eyes, and, instead of bending backwards like other animals, they jet forward above the eyes, and bend backward at the extremities in a small circle, and end in a very sharp point. His ears are placed in a very elegant manner near the horns, and there are stripes of black on each side of the face, the rest being of a whitish yellow, which never changes. The horns of this animal are often made use of for the heads of canes; those of the female are less, and not so much bent; and some farriers make use of them for bleeding cattle. The hides of these animals are very strong, nervous, and supple, and when dressed, excellent breeches, vests, and gloves, are made of them; this sort of cloathing is very durable, and of very great service to labouring men. The chamois is a native of cold countries, and generally prefers craggy rocks and high places; they indeed frequent the woods, but it is only those in the highest regions, where the forests consist of firs, larch, and beech trees. These animals have so much dread of heat, that in summer they are only to be found in the caverns of rocks amidst fragments of congealed ice, or in forests where the high and spreading trees form a shade for them, or under rough and hanging precipices that face the north, where the rays of the sun seldom disturbs them. They go to pasture both morning and evening, but seldom during the day. They traverse over rocks with great facility, where the dogs cannot follow them. There is nothing more wonderful than to see them climbing and descending precipices, inaccessible to all other quadrupeds. They mount and descend always in an oblique direction, and throw themselves down a rock of twenty or thirty feet, and alight with great security. In descending they strike the rock with their feed, three or four times, to stop the velocity of their motion; and when they have got upon the base below, they at once seem fixed and secure. In fact, to see them thus leaping among the precipices, they seem rather to have wings than legs, so great is the strength of their nerves. Some writers have pretended that they use their horns for climbing and descending the precipices. I have seen and killed many of these animals, but I never saw them use their horns for that purpose, nor have I ever found any hunter who could confirm this assertion. The chamois ascends and descends precipices with great ease, by the agility and strength of his legs, which are very long; the hind ones being somewhat the longest and always crooked, assist them in throwing themselves forwards, and are of great service by breaking the force of the fall. It is asserted, that when they feed, one of them is deputed to stand sentinel for the security of the rest. I have seen many flocks of these animals, but never observed that to be the case. It is certain that when there are a great number of them there will always be some looking about while the rest are grazing; but there is nothing in this particularly distinguishable from a flock of sheep; for the first who perceives any danger warns all the rest, and in an instant the terror with which he is struck spreads through the whole flock. During the rigours of winter, and in the deep snows, the chamois retreats so the lower forests, and feeds upon the pine-leaves, buds of trees, bushes, or such dry or green shrubs and grass as they can discover by scratching off the snow with their feet. The more craggy and uneven the forest, the more this animal is pleased with its abode. The hunting of the chamois is very difficult, and laborious. The most usual way is by hiding behind some of the clefts of the rocks, and shooting them as they pass; for this method the sportsman is obliged to take great precaution in concealing himself; observing, at the same time, to keep the wind in his face. Others hunt this animal as they do the stag, by placing some of the hunters at all the narrow passages, while others beat round to alarm the game. Men are more proper for this sort of hunting than dogs, who when employed, often disperse the chamois too soon, when they immediately fly to a considerable distance; the men also find it a dangerous sport, for when the animal observes his retreat shut up, he directly makes at the hunter with his head, and frequently knocks him down."

With regard to the specific virtues attributed to the blood of the wild goat, in the cure of certain diseases, especially in the pleurisy, a virtue thought to belong particularly to this animal, and which would indicate it to be of a particular nature, it is now known that the blood of the chamois, and also of the domestic he-goat, has the same properties when fed on the same aromatic herbs; so that even by this property these three animals appear to be united in the same species.

SUPPLEMENT.

BESIDES the Syrian goat, which we formerly mentioned as having pendulous ears, there is a species in Madagascar, which are much larger, and with pendulous ears so long, that they hang entirely over their eyes, which obliges the animal to be almost continually throwing them back, and therefore whenever pursued, he invariably makes to the rising ground. The accounts which we received of this animal came from M. Comerson, but were not sufficiently particular to determine whether it was a different species or only a variety of the Syrian race with pendulous ears.

M. le Vicomte de Querhoënt says, that the goats left on Ascension Island have increased abundantly, but they appear very thin, and so weak, that men can often outrun them; they are of a very dark brown, much less than our goats, and in the nights conceal themselves in the holes of the mountains.

THE SAIGA.

THERE is a species of goat found in Hungary, Poland, Tartary, and in South Siberia, which the Russians call *Saigak*, or *Saiga;* it bears a resemblance to the domestic goat in the shape of its body and its hair; but by the form of the horns, and the want of a beard, it approaches nearer to the antelopes, and, in fact, appears to be the shade between those two animals; for the horns of the saiga are in every respect like those of the antelope; they have the same form, transverse rings, longitudinal streaks, &c. and they differ only by the colour. The horns of the antelopes are black and opaque; those of the saiga, on the contrary, are whitish and transparent. Gesner has mentioned this animal under the name of *colus*, and Gmelin under that of *saiga*. The horns which are in the royal cabinet, were sent under the denomination of *the horns of the Hungarian buck;* they are so transparent and so clear, that they are used for the same purpose as tortoise-shell.

The saiga, by its natural habits, resembles more the antelopes, than the wild or chamois goats; for it does not delight in mountainous countries, but lives on the hills and plains. Like them also he moves by bounds and leaps; he is very swift, and his flesh much better eating than that of either the tame or wild goat.*

THE GAZELLES, OR ANTELOPES.

THERE have been thirteen species, or, at least, thirteen distinct varieties made of these animals; in this uncertainty, whether they are varieties, or species, we thought it best to treat of them all together, assigning to each a particular name. The first of these animals, and the only one to which we retain the generic name of *gazelle*, is the common *gazelle*, (*fig.* 153.) which is found in Syria, Mesopotamia, and the other provinces of the Levant, as well as in Barbary, and in all the northern parts of Africa. The horns of this animal are about a foot long, entirely annulated at the base, lessening into half-rings towards the extremities which are smooth. They are not only surrounded with rings, but also furrowed longitudinally by small streaks. These rings mark the years of their growth, which is commonly about twelve or thirteen. The gazelles in general, and this tribe in particular, greatly resemble the roe-buck in the proportions of the body, natural functions, swiftness, and the brightness and beauty of the eyes. These resemblances would tempt us to think, as the roe-buck does not exist in the same countries with the gazelle, that the latter was only a degeneration of the first; or, that the roe-buck is a gazelle, whose nature had been altered by the influence of the climate and effects of food, did not the gazelles differ from the roe-buck in the nature of their horns; those of the roe-buck are a kind of solid *wood*, which fall off, and are renewed every year, like those of the stag; the horns of the gazelles, on the contrary,

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* Pallas thinks that the saiga which is found in Hungary, Transylvania, Wallachia, and in Greece, is also to be found in the island of Candia; and he thinks that the *sptrepsicoros* of Belon ought to be considered as such. Buffon, however, was not of that opinion, who referred the *sptrepsicoros* of Belon to the class of sheep.

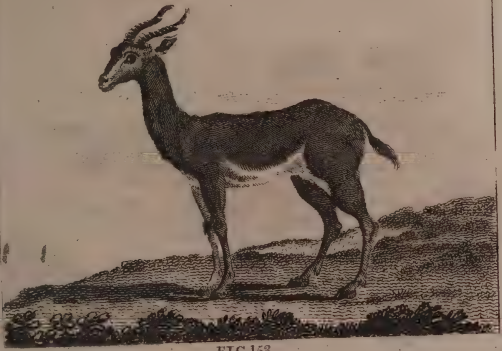

FIG.153

Gazelle

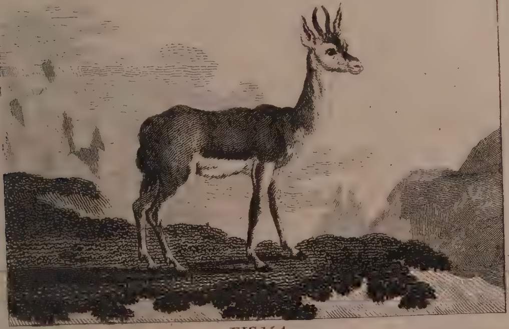

FIG.154

Corine

trary, are hollow and permanent like those of the goat. The roe-buck has also no gall-bladder, which is to be found in the gazelle. The gazelles have, in common with the roe-bucks, deep pits under the eyes, and they resemble each other still more in the colour and quality of the hair, in the bunches upon their legs, which only differ in being upon the fore-legs of the gazelle, and upon the hinder legs of the roe-buck. The gazelles, therefore, seem to be intermediate animals between the roe-bucks and goats; but, when we consider that the roe-buck is an animal which is to be found in both continents, and that the goats, on the contrary, as well as the gazelles, belong only to the old world, we shall be induced to conclude that the goats and gazelles are more nearly related to each other, than they are to the roe-buck. The only characters peculiar to the gazelles, are the transversed rings and longitudinal depressions on the horns, the bunches of hair on the fore-legs, the thick streaks of black, brown, or red hair upon the lower part of the sides, and three streaks of whitish hair to the internal surface of the ears.

The second gazelle is an animal found in Senegal, which M. Adanson informs us, is there called *kevel.* It is something less than the former, and nearly of the size of a small roe-buck; it differs also in its eyes, which are much larger; and its horns, instead of being round, are flattened on the sides, and this flattening of the horns is not a sexual difference; the male and female gazelles have them round, or more properly speaking, compressed; in other respects, they entirely resemble each other. They both have yellow-coloured hair, thighs and belly white, the tail black, a brown stripe under the flank, three white streaks in the ears, black horns surrounded with rings, with the longitudinal depressions, &c. but it is certain, that the number of these rings is greater in the kevel than in the gazelle, the last having generally but twelve or thirteen, and the former at least fourteen, and often eighteen or twenty.

The third is called *corine* (*fig.* 154.) from *korin*, the name it bears in Senegal. It greatly resembles the gazelle and the kevel, but is still less than either; its horns are also thinner and smoother, the rings being scarcely discernible. M. Adanson, who communicated to me his description of this animal, says, that it seemed a little tending to the chamois goat, but that it is much smaller, being in length only two feet and a half, and not quite two feet in height; that its ears are four inches and a half long, its tail three inches, its horns six inches long, and not an inch thick; that they are two inches distant from each other at the base, and about five or six at their extremities; that, instead of annular prominences, they have only transverse wrinkles very close to each other in the lower part, and more distant in the upper, and that these wrinkles, which are in the place of rings, are about sixteen in number; that its hair is short, fine, and glossy, yellow on the back and flanks, and white under the belly and the inside of the thighs and a black tail; and that there are some of these animals whose bodies are often sprinkled with irregular white spots.

These differences between the gazelle, the kevel, and the corine, although very apparent, especially in the corine, do not appear to be essential, nor sufficient to divide these animals into different species; for they resemble each other so much in every other respect, that they seem to be all three of the same species, more or less varied by the influence of climate and food. There is much less difference between the kevel and the gazelle, than the corine, whose horns in particular bear no resemblance to those of the other two; but all three have the same natural habits; they assemble and feed together in herds; they are of mild dispositions, and easily accustomed to a domestic state and the flesh of all three is very good to eat. We think ourselves therefore, authorised to conclude that the gazelle and kevel are certainly of the same species, and that it is uncertain, whether the corine be only a variety of the same species or whether it be a different one.

In the royal cabinet of France, there are skins of these three different antelopes, besides which, there is a horn that bears a great resemblance to those of the gazelle and kevel, but much larger; this horn is engraven in the works of Aldrovandus, *Lib.* I. *de Bisulcis*, c. xxi, Its thickness and length seem to indicate a much bigger animal than the common gazelle, and it appears to me to belong to an antelope which the Turks call *tzeiran*, and the Persians *abu*. This animal, according to Olearius, in some measure resembles our fallow-deer, except being rather of a red than yellow colour; the horns, likewise, are without antlers, and rest upon the back, &c. M. Gmelin, who describes it under the name of *dsheren*, says, it resembles the roe-buck, with this exception, that the horns like those of the wild goat, are hollow and never fall off. He also adds, that in proportion as the horns increase in growth, the cartilage of the larynx thickens, and forms a considerable prominence under the throat when the animals are advanced in years. According to Kœmpfer the *ahu* differs not in the least from the stag in its form, but that his horns appear nearer to those of the goat, which are single, black, and annulated, as far as the middle, &c. Some other authors have likewise made mention of this species of antelope under the name of *geiram* and *jarain*, which it is easy to restore, as well as that of *dsheren* to the primitive name of *tzeiran*. This antelope is common in South Tartary, in Persia, in Turkey, and is also to be met with in the East Indies.

To these four first species, or races of antelopes, may be added two other animals, which greatly resemble them; the first is called *koba* at Senegal where the French have stiled it the *great brown cow*; the second is also a native of Senegal, and is there called *kob*, but our countrymen denominate it the *small brown cow*. The horns of the kob greatly resemble those of the gazelle and kevel, but the shape of the head is different, the muzzle is longer, and there are no pits under the eyes. The koba is much larger than the kob; the latter is about the size of the fallow-deer, and the other is as large as the stag. From the remarks of M. Adanson, it appears that the *koba* is five feet long, from the extremity of the muzzle to the insertion of the tail; that its head is fifteen inches, its ears nine, and its horns from nineteen to twenty; that its horns are flattened on the sides and surrounded with ten or twelve rings, while those of the *kob* have only eight or nine, and are not more than a foot in length.

The seventh animal of this species is found in the Levant but more commonly in Egypt, and in Arabia. We call it, from its Arabian name, *algazel;* it is shaped pretty much like the other antelopes, and is nearly the size of the fallow-deer, but its horns are long, thin, and but little bent till toward their extremities, when they turn short with a sharp flexion; they are black and almost smooth, and the annular prominence scarcely observable, except towards the base, where they are a little more visible. They are about three feet in length, while those of the gazelle are not more than one foot, those of the kevel fourteen and fifteen inches, and those of the corine (which, nevertheless resembles this the most) only six or seven inches.

The eighth animal is generally called the

Bezoar antelope, but by the eastern nations *pasan*, which name we retain. A horn of this animal is very well represented in the German Ephemerides, and the figure of the animal itself has been given by Kœmpfer, but his description is faulty in the horns, which are neither sufficiently long nor straight. His description likewise, does not appear to be exact, for he says, that this animal has a beard like the he-goat; and yet, he has given a figure of it without one, which seems more conformable to truth; for the want of a beard is the principal character by which antelopes are distinguished from goats. This antelope is of the size of our domestic he-goat, and has the colour, shape, and agility of the stag. We have seen a skull of this animal with the horns on it, and two other horns separate. The horns which are engraved in *Aldrovandus*, *de quad. Bisulcis*, p. 765. C. 24 *de Orige*, bear a great resemblance to these. In most respects, the *algazel* and the *pasan*, appear to have a great affinity; they are also natives of the same climate, and are found in the Levant, Egypt, Arabia, and Persia; but the algazel feeds upon the plains, and the pasan is only found on the mountains. The flesh of both is very good food.

The ninth antelope is an animal which, according to M. Adanson, is called *nangueur*, or *nanguer* (*fig*. 155) at Senegal. It is three feet and a half long, and two feet and a half high; it is of the colour of the roe-buck, yellow on the upper part of the body, white under the belly and inside of the thighs, with a spot of the same colour under the neck. Its horns are permanent like those of the other antelopes, and are about six or seven inches in length; they are black and round, but what is singular, they bend forwards, at the points nearly in the same manner as those of the chamois goats bend backwards. These nanguers are very beautiful animals, and very easy to tame. All these characters, and principally that of the horns bending forward, induces me to think, that the nanguer may possibly be the dama, or fallow-deer, of the ancients. "Cornua rupicapris in dorsum adunca, damis in adversum," says Pliny. As these are the only animals who have their horns bent in this manner, we may presume that the nanguer of Africa, is the dama of the ancients; especially, as Pliny says in another place, that the dama is only to be found in Africa. In short, by the testimonies of other ancient authors, we find, that the dama was a timid and peaceable animal, who had no other resource for his safety than in the swiftness of his running. The animal which Caius has given the figure and description of, under the name *dama Plinii* being found, according to that author's own testimony in the north of Great Britian and in Spain, cannot possibly be the dama mentioned by Pliny, because he says, it was only to be found in Africa. Besides, this animal, which Caius has described, is furnished with a beard like a goat, and not one of the ancients has spoken of the dama as having a beard. I am inclined therefore to believe that this dama of Caius is only a goat, whose horns being a little bent at their extremities, like those of the common gazelle, made him imagine it to be the dama of the ancients. Besides this character of the horns being bent forwards, which is the most certain index of the dama, is not properly marked iu any other animal except the nanguer of Africa. From the remarks of M. Adanson, it appears, there are three varieties of these nanguers, which only differ in the colour of the hair, but all their horns bend forwards in a greater or lesser degree.

The tenth gazelle is a very common animal in Barbary and Mauritania, and which the English call *antelope*, a name we shall likewise adopt. This animal is of the size of a roe-buck, and greatly resembles the gazelle and the kevel, yet it differs from them in so many particulars, that it may be looked upon as a different species. The antelope has deeper eye-pits than the gazelle; its horns are near fourteen inches long almost touching each other at the bottom, yet their points are fifteen or sixteen inches asunder. They are surrounded with rings and semi-rings like the gazelle and kevel, but not so distinguishable; but what particularly discriminates the antelope, is its horns having a double flexion, which gives them the appearance of an antique lyre. The antelope, like other gazelles, is yellow on the back, and white under the belly; but these two colours are not separated by the black streak which is to be found in all the rest of the gazelle kind.

There seems to be different races of the antelope as there are in the other gazelles. 1. In the royal cabinet is a horn, which must be attributed to a much larger antelope than that we have been speaking of; it is called *lidmee*, a name, which according to Dr. Shaw, the Africans give to the antelopes. 2. In the cabinet of he Marquis de Marigny is a kind of an offensive weapon composed of two sharp-pointed horns about the length of a foot and a half which, by their double flexion, seem to belong to a much smaller antelope than any of the rest. It must be very common in the Indies, as their Faquirs, and other priests, carry this sort of weapon as a mark of dignity. We shall call it the *Indian antelope*, from its having the appearance of being only a simple variety of the *African species*.

By this enumeration of the gazelles, or antelopes, we find there are twelve species, or distinct varieties: viz. 1. The common gazelle; 2. The kevel; 3. The corine; 4. The tzerain; 5. The koba, or great brown cow; 6. The kob, or small brown cow; 7. The algazel, or antelope of Egypt; 8. The pasan, or pretended bezoar; 9. The nanguer, or dama of the ancients; 10. The antelope; 11. The lidmée; and, 12. The Indian antelope. After having carefully compared them, we are induced to conclude that the common gazelle, kevel, and corine, are only three varieties of one species: 2. That the tzeiran, koba, and kob, are varieties of another: 3. That the algazel and the pasan are probably only two varieties of the same species; and that the name *bezoar-gazelle*, which has been given to the pasan, is no distinctive character; for we think ourselves able to prove, that the Oriental bezoar does not come from the pasan alone, but from all the gazelles and goats which live in the mountains of Asia: 4. That the nanguers, whose horns are bent forwards, and of which there are two or three varieties, have been indicated by the ancients under the name of the *dama*: 5. That the antelopes, which are three or four in number, and differ from all others by the double flexion of their horns, were also known to the ancients by the names of *strepsiceros*, and *addax*. All these animals are to be found in Asia and Africa that is in the old continent, and to these five principal species, which contain twelve very distinct varieties, we shall not add two or three other kinds, of America, to which the indefinite name of *gazelle* has also been given, although they are different from all those we have already noticed; as it would only increase the confusion, which is already too great. We shall give the history of these American animals, under their real names of Mezame, Temamaçame, &c. and shall here speak only of those animals of this species which are found in Africa and Asia: we shall also refer to the following articles, several other animals of Africa and Asia, which have been considered as antelopes or goats, though they appear to be an intermediate species; such as the bubalus, or Barbary cow, the condoma, the guib, the grimm, &c. without including the chevrotains, which greatly resemble the small goats or antelopes, but of which we shall speak in a separate article.

It is now easy to perceive how difficult it was to arrange all these animals, which amount to thirty, ten goats, twelve or thirteen antelopes, three or four of the bubalus, and as many chevrotains, all different from eath other; many of them were unknown, the others confusedly mentioned by naturalists, and confounded one for another by travellers. This is the third time that I have written their history, and I must say, that the trouble much exceeded the produce, though I have done as much as possible with the materials and knowledge I was able to acquire.

By comparing the remarks which have been made by ancient and modern authors, with the knowledge we have acquired by experience, we find, 1. That the *dorcas* of Aristotle is not the gazelle but the roebuck; notwithstanding that this name has been used by Ælian, not only to denote wild goats in general but particularly the Lybian or common gazelle. 2. That the *strepsiceros* of Pliny, or the *addax* of the Africans,

cans, is the antelope. 3. That the *dama* of Pliny is the *nanguer* of Africa, and not our fallow-deer, or any other European animal. 4. That the *prox* of Aristotle agrees with the *zorkes* of Ælian, and is the same with the *platyceros* of the more modern Greeks, which name the Latins have adopted to denote the fallow deer, "*Animalium quorumdam cornua in palmas finxit natura; digitosque emisis ex iis unde platycerotas vocant*," says Pliny. 5. That the pygargos of the Greeks is probably the gazelle of Egypt, or that of Persia; that is, the *algazel* or *pasan*. The word *pygargos* is only used by Aristotle to denote a bird, the *white-tailed eagle;* but Pliny employed it to denote a quadruped. The etymology of pygargus indicates, 1. An animal with white haunches, such as the roe-bucks or gazelles. 2. A timid animal; the ancients imagining that white thighs were an index of timidity, attributed the intrepidity of Hercules to his having black ones. But as almost every author, who speaks of the pygargus as a quadruped, mentions also the roe-buck; it is clear that the name can only be applied to some species of gazelle, which is different from the dorcas Lybica, or common gazelle, and from the strepsiceros, or antelope, which the same authors speak of. We therefore think, that the *pygargus* denotes the *algazel* or *gazelle* of Egypt, which must have been known to the Greeks as well as to the Hebrews; for we find the name of pygargus in the Septuagint version*, among the number of animals whose flesh is deemed clean; the Jews, therefore, eat the pygargus, or that species of gazelle which is common in Egypt and the adjacent countries.

Mr. Russel, in his History of Aleppo, says, that near that city there are two sorts of gazelles; the one called the *mountain gazelle*, which is the most beautiful, and whose hair on the neck and back is of a deep brown; the other, called the *gazelle of the valley*, which is neither so swift nor so well made as the first, and whose hair is also much paler. He adds, that these animals run so quick and so long that the swiftest dogs cannot catch them, without the assistance of a falcon; that in winter the gazelles are lean, but yet their flesh is of a good flavour; that in summer it abounds with fat, like our venison; and that those which are fed at home do not eat so well as the wild ones. From this testimony of Mr. Russel, and from that of M. Hasselquist, we may perceive that the gazelles of Aleppo are not the common gazelles, but those of Egypt, whose horns are straight, long, and black, and whose flesh is excellent eating. We find also from these testimonies, that they are half domestic animals; that they have been early tamed, and that consequently many different varieties or kinds have been formed among them, as well as in other domestic animals. These Aleppo gazelles are the same therefore as those we have called algazells, and are still more abundant in the Thebaid and Upper Egypt than the environs of Aleppo. They feed on aromatic herbs and the tender bark of young trees: they are commonly found in herds, or rather in families, consisting of five or six. Their cry resembles that of the goat. They are hunted not only with dogs, assisted by the falcon, but also with the *ounce**.

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* Deuteronomy, chap. xiv.

In some places they take the wild gazelles by means of a tame one, to the horns of which they fasten a snare made of ropes. When a herd of wild gazelles is found, the tame one is sent among them, but he no sooner approaches than one of the males of the wild herd advances to oppose him, and in butting with his horns is soon entangled in the noose. In this struggle they both commonly fall to the ground, when the hunter coming up kills the one and disengages the other.

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* See history of this animal, page 68, vol. VII.

The antelopes, especially the largest sort, are much more common in Africa than in India, they are stronger and fiercer than the other gazelles, from which they are easily distinguished by the double flexion of their horns; and not having either the black or brown streak on their sides. The middling antelopes are about the size of the fallow-deer; their horns are very black, their belly very white, and their fore-legs shorter than the hind ones. They are well made, and extremely clean animals, never lying down but in dry places; they are likewise very swift, watchful, and apprehensive of danger; in open places they look round, and when they see a man, a dog, or any other enemy, they fly with all speed. But, notwithstanding this natural timidity, they have a kind of courage, for if surprised, they turn suddenly round, and face those who attack them with great firmness.

The antelopes, in general, have large black eyes, very brilliant, and so beautiful that the Orientals employ them proverbially, in praising the eyes of their mistresses. A gazelle-eyed beauty is the highest compliment a lover can pay. Their limbs are finer and more delicate than those of the roe-buck; their hair is as short, and more soft and glossy; their hind legs are longer than those before; like the hare, therefore, they have greater security in ascending than in descending steep places. Their swiftness is equal to that of the roe-buck: but the latter hastens on by bounds, while the former runs in an uninterrupted course. Most of them are yellow upon the back, white under the belly, with a black stripe which separates these two colours below the flanks. Their tails are of various lengths, but always covered with a pretty long blackish hair; their ears are long, erect, open, and terminating in a point: they all have cloven hoofs nearly like the sheep; both males and females have permanent horns, but the latter have them thinner and shorter than the former.

Such is the whole information which we have been able to acquire concerning the different species of gazelles, and their natural dispositions and habits. Let us now see how far naturalists have been right in attributing the production of the oriental *bezoar* to one kind of those animals only; and whether this animal be really the *pasan* or *pazan*, which they have described by the name of the *bezoar gazel*. In examining the description and the figures of Kœmpfer, who has written a great deal on this subject, it is doubtful whether he means that the pazan or the algazel is the only animal which produces the oriental bezoar. If we consult other naturalists and travellers, we shall be tempted to believe that this stone is the production not only of gazelles but of wild and domestic goats, and even sheep, the formation of which probably depends more on the temperature of the climate, and the quality of the food, than on the nature or the species of the animal. If we believe Rumphius, Seba, and some other authors, the true oriental bezoar is the production of apes and not of gazelles, goats, or sheep. But this opinion of Rumphius and Seba is not founded, for we have seen many of these concretions, to which the name of ape bezoar has been given, but they are quite different from the oriental bezoar, which is certainly produced by a ruminating animal, and is easily distinguished from all other bezoars by its shape, substance, and colour, which is generally that of an olive, and brown within, while the *occidental* bezoar is of a pale yellow. The substance of the first is soft and porous; that of the last hard, dry, and as it were petrified. Besides, as prodigious quantities of the oriental bezoar was consumed in the last century; and as it was used in Europe and Asia for all cases in which our present physicians give cordial medicines, and antidotes against poison, may we not presume, from the great quantities which were formerly, and are still, in some degree, consumed, that this stone is produced, not from a single species of animal but from many, and that it is equally the production of gazelles, goats, and sheep, who cannot produce it but in certain climates of the Levant and Indies.

In all that has been written on this subject we have not met with one distinct observation, nor a single decisive argument. It only appears, by what Monard, Garcias, Clusius, Aldrovandus, and others, have said, that the oriental bezoar animal is not the common and domestic goat, but a species of wild goat which they have not characterised. Thus, likewise, all that can be gathered from Koempfer is, that the bezoar animal is a kind of wild goat, or rather gazelle; but by the testimonies of Thevenot, Chardin, and Tavernier, it seems that this stone is obtained more from sheep and wild or domestic goats, than from gazelles. What gives great weight to the assertions of these travellers is, that they speak from ocular inspection, and because, although they do not mention the gazelles on this occasion, there is no appearance of their being deceived, as they knew them perfectly well, and mention them in other parts of their works. We must not, therefore, conclude, with our ancient naturalists, that the oriental bezoar is exclusively the production of a particular species of gazelle, for I must own, that after having examined not only the testimonies of authors, but such facts as might decide the question, I am inclined to believe, that this stone proceeds equally from the greatest number of ruminating animals, but more commonly from goats and gazelles. This stone is formed of concentric layers, and often contains foreign matter in its centre. I have endeavoured to find out the nature of this matter, which serves as a nucleus to the bezoar, supposing from that a judgment might be formed of the animal that possesses them. This nucleus is of various kinds; sometimes I found them to consist of pieces of flint, stones of plumbs, tamarinds, seeds of cassia, and particularly pieces of straw and buds of trees, therefore I could not hesitate to attribute this production to those animals which brouze upon shrubs and leaves.

The oriental bezoar then is clearly not the production of one particular animal but of many different ones; and it is not difficult to reconcile the testimonies of most travellers with this opinion. The ancients, both Greeks and Latins, have no knowledge of the bezoar. Galen is the first who speaks of its virtues as an antidote against poison. The Arabs, likewise, praise the bezoar as possessing those qualities; but neither the Greeks, Latins, nor Arabians, particularly describe the animals which produce it. Rabi Moses, an Egyptian, only says, that some pretend this stone is formed in the angles of the eyes, and others in the gall-bladder of the eastern sheep. Indeed there are bezoars, or, more properly speaking, concretions, formed in the eyes of stags, and some other animals; but these concretions are very different from the oriental bezoar, and all the concretions in the gall-bladder are of a light, oily, and inflammable matter, which bears no resemblance to the substance of the bezoar. Andreas Lacuna, a Spanish physician, says, in his Commentaries on Dioscorides, that the oriental bezoar is extracted from a certain kind of wild goat which feeds in the mountains of Persia. Amatus Lusitanus confirms Lacuna's remarks, and adds, that this mountain-goat greatly resembles our stag. Monard, who quotes all three, still more positively affirms, that this stone is produced from the internal parts of a mountain-goat in India, to which, he says, I have affixed the name of *cervi-capra*, because it inclines both to the goat and the stag; for it is nearly of the size and shape of the stag, but its horns, like those of the goat, are very simple, and very much bent backwards. Garcias ab Horto says, that in Corasson, and in Persia, there is a kind of he-goats, called *pasans*, and that it is in their stomachs the oriental bezoar is formed; that as well as in Persia it is found in Malacca, and near Cape Comorin, and that in great numbers of the goats killed for the subsistence of the troops these stones are regularly sought for and found in their stomachs. Christopher Acosta confirms what Garcias and Monard have said, without adding any thing new; in short, not to omit any thing which has a relation to the historical detail of this stone, Koempfer, a man of more learning than exactness, being in the province of Laar, in Persia, says, that he went with the natives of that country to hunt the *pasan*, which produces the bezoar, and that he saw them extract that stone; besides which, he affirms, that the true oriental bezoar proceeds from this animal; that the buck *ahu*, of which he has also given a figure, produces the bezoar, but that they are of a very inferior quality.

By his figures of the pasan and ahu we might be induced to believe, that the first represents the common gazelle rather than the true pasan; and from his description we might imagine his pasan to be a he-goat and not a gazelle, as he gives it a beard resembling that of the goat; and from the name *ahu*, which he gives to his other buck, as well as by his second figure, we might rather suppose it to be the wild goat than the true ahu, which is our tzeiran, or large gazelle. What is yet more singular, Koempfer, who seems willing to decide the species of animal that produces the oriental bezoar, and affirms, that it is the wild buck called the pasan, quotes, at the same time, a man, whose word, he says, may be relied on, who felt the bezoar stones in the belly of the gazelles of Golconda. Thus all the positive conclusions that can be drawn from Kœmpfer is, that there are two kinds of wild goats, the pasan and ahu, which produce the bezoar in Persia, and that in the Indies this stone is likewise found in the gazelles.

Chardin positively says, that oriental bezoar is found in the wild and domestic goats on the shore of the Persian gulph, and in many provinces of India; and that in Persia it is also to be met with in sheep. Dutch travellers say the same; Tavernier still more positively affirms, that they are found in the stomachs of domestic goats, whose hair is as fine as silk, and that having bought six of these goats alive, he extracted from them seventeen bezoar stones, and a portion of another, about the size of half a nut, and then adds, that there are other bezoars supposed to proceed from apes, the virtues of which are still greater than those of the goats; that there is also cow bezoar, but the virtues are inferior to the others, &c. What can we infer from such a variety of opinions and testimonies? What can we conclude from them? unless it be admitted that the oriental bezoar proceeds not from one single species but from many different animals, particularly gazelles and goats.

With respect to the occidental bezoar we can affirm they proceed neither from goats nor gazelles, for we shall prove there is neither of them, nor even any animal of that genus, in all the extent of the new world. Instead of gazelles we only meet with roe-bucks in the woods of America; instead of wild goats and sheep, lamas and pacos animals of a quite different nature, and of which we have already treated. The ancient Peruvians had no other cattle, and, at the same time, that these two species are almost reduced to a domestic state, they subsisted in much greater numbers in their natural condition upon the mountains. The wild lamas were called *huanacus*, and the pacos *vicunnas;* from whence the French have derived the name of *vigogne*, which denotes the same animal as the pacos; both the pacos and the lamas produce bezoras, but the tame ones more seldom than the wild.

M. Daubenton, who has more minutely inspected the nature of bezoar stones than any other person, thinks they are composed of something similar to that which fastens itself to the teeth of ruminating animals in the form of a shining tartareous matter; and it is evident, from the collection of bezoars, of which there are a great number in the royal cabinet, that there are essential differences between the oriental and occidental bezoars. Thus the East Indian goats, or the gazelles of Persia, are not the only animals which produce the concretions, called bezoars for the chamois, and, perhaps, the wild goat of the Alps, the he-goats of Guinea, and many animals of America, afford this substance; and, if we comprehend under this name all concretions of this nature, which are met with in different animals, we may be assured, that most quadrupeds, excepting carnivorous ones, and even crocodiles and alligators, produce bezoars.

To form, therefore, a clear idea of these concretions it will be necessary to divide them into several classes, and refer them to the animals which produce them, and the climates and food which mostly assist in their production.

First, then, the stones formed in the bladder and kidneys of men, and other animals, must be distinguished from the class of bezoar, and described by the name of *calculi*, their substance being quite different from that of the bezoars; they are easily known by their weight, their urinous smell, and their structure, which is not regular, nor formed with concentric layers, like that of the bezoar.

2. The concretions that are often found in the gall-bladders and liver, of the human species, and other animals, must not be regarded as bezoars; they may easily be distinguished by their lightness, colour, and inflammability; besides they are not formed by layers encircled round a nucleus, as in the bezoar.

3. The balls frequently found in the stomachs of animals, and especially in those that ruminate, are not true bezoars. These balls, which are called *ægagropili*, are composed internally

of the hair the animal has licked off his hide and swallowed, or from hard roots, which he could not digest, their external part is encrusted with a viscous substance, something like that of the bezoar. The *ægagropili*, therefore, have nothing in them, except this external layer, in common with the bezoar, and simple inspection is sufficient to distinguish one from the other.

4. *Ægagropili* are often found in the animals of temperate climates, but never any bezoars. Our oxen and cows, the Alpine chamois, and the porcupine of Italy, produce only *ægagropili*. Animals of hotter countries, on the contrary, only produce bezoars. The elephant, the rhinoceros, the goats, the gazelles of Asia and Africa, the lama of Peru, and others, produce, instead of *ægagropili*, solid bezoars, whose substance and size vary according to the difference of the animals and the climates in which they live.

5. The bezoars, to which such virtues and properties have been attributed, are the oriental kind, which, as we have said, proceed from goats, gazelles, and sheep, which feed on the mountains of Asia. The bezoar of an inferior quality, which is called *occidental*, proceeds from the lamas and pacos, which are found in

the mountains of South America. In a word, the goats and gazelles of Africa also produce bezoars, but not of so good a quality as those of Asia.

From all these facts we may conclude, that, in general, the bezoar is only a residue of vegetable nutriment which is not to be found in carnivorous animals, and is peculiar to those who feed on plants; that in the southern mountains of Asia, the herbs being stronger than in any other part of the world, the bezoar, which is the residue of that food, has also more virtues than any other; that in America, where the heat is less, and the mountain herbs being weaker, the bezoars produced there are also inferior; and that in Europe, where the herbs are still weaker, and in all the valleys of both continents, where they are coarse, no bezoars are produced, but only *ægagropili*, which contain nothing but hair, roots, or filaments, which the animal was unable to digest.

THE BUBALUS, AND OTHER ANIMALS WHICH HAVE AN AFFINITY TO THE GAZELLES AND GOATS.

WE have already taken notice in our description of the buffalo, of the name bubalus being improperly applied to that animal. This name belonged formerly to the animal which we are now about to describe, and which is of a very distant nature from the buffalo. It resembles the stag, the gazelle, and the ox, in many respects; to the stag, by the size and shape of its body, particularly in its legs, but its horns are permanent, and nearly like those of the largest gazelles, to which it has an affinity both in this character and in its natural habits; its head, however, is much longer than that of the gazelles, or even that of the stags. He resembles the ox by the length of the muzzle and the disposition of the bones of the head, the *cranum* not advancing beyond the *os frontalis*: these different marks of conformation, joined to its ancient name, being forgotten, is the reason why it has obtained the several names of *busephalus*, the bull-stag, *bucula-*

cula-cervina, the cow-hind, the Barbary cow, &c. Even the name of *bubalus* comes from *bubulus*, and has been applied to this animal from its similitude to the ox.

The head of the bubalus is narrow and very long, the eyes are placed very high, the forehead very short and narrow, the horns permanent, black, thick, and very closely annulated: they are close to each other at the root, but spread very distant at their extremities; they are crooked backwards, and twisted like a corkscrew; his shoulders are so elevated that they form a sort of bunch upon the withers; the tail is nearly a foot long, and furnished with a bunch of hair at its extremity; and the ears resemble those of the antelope. Kolbe calls this animal by the name of *elk*, although it only resembles the elk by its hair being finer at the root, than in the middle or at the points; this character is peculiar to these two animals, for the hair of almost every other quadruped is thicker at the root than at the middle and point. The hair is nearly of the same colour as the elk, though much shorter, thinner, and softer. These alone are the resemblances between the bubalus and the elk; in every other respect these two animals are entirely different. The horns of the elk are larger and heavier than those of the stag, and are renewed every year; the bubalus, on the contrary, does not shed its horns, but they continue their growth during life, and in form and texture are like those of the gazelles. He resembles the gazelles also by the shape of his body, the smallness of his head, the length of his neck, the position of his eyes, ears, and horns, and in the shape and length of the tail. The gentlemen of the Academy of Sciences, to whom one of these animals was presented by the name of the *Barbary cow*, and who adopted that denomination, did not hesitate to acknowledge it to be the *bubalus* of the ancients. Though we have rejected this denomination of *Barbary cow*, as equivocal and confused, yet as for the rest, we could not do better than copy the exact description those gentlemen have given of this animal, and by which we perceive it is neither gazelle, goat, cow, elk, nor stag, but a particular and distinct species. This animal is also the same that Caius has described under the name of *buselaphus*, and I was surprised that the gentlemen of the Academy did not make this remark, since all the characters which Caius gives to his buselaphus agree with their Barbary cow.

In the royal cabinet is, first, the skeleton of a bubalus a bubalus the gentlemen of the Academy had described and dissected, by the name of the Barbary cow. Secondly, a head much larger than that of this skeleton, the horns of which are also much longer and thicker. Thirdly, a part of another head, with horns as large as the foregoing, but their form and direction are different. There are, therefore, in the bubalus, as well as in the gazelles, antelopes, and others, varieties in the size of the body, and in the shape of the horns; but these differences do not appear to be considerable enough to make distinct and separate species.

The bubalus is common in Barbary, and in all the northern parts of Africa; he is nearly of the same nature as the antelopes, and has, like them, short hair, black hide, and his flesh is good to eat.

THE CONDOMA.

THE Marquis de Marigny, who embraces every opportunity of encouraging the arts and sciences, shewed me in his cabinet the head of an animal, which, at first sight, I imagined to belong to a large bubalus. It resembled those of our largest stags; but instead of solid horns, like those of the stag, it had two large and hollow ones with a ridge, like those of the he-goat, and with double flexions, like those of the antelope. In examining the royal cabinet for what might be relative to this animal, we found two horns; the first without any mark or name, came from his Majesty's wardrobe; the second was given to me in 1760 by M. Baurhis, commissary of the Marines, with the name of *condoma* of the Cape of Good Hope affixed to it. This name we have adopted, as the animal which it denotes has never before been described nor denominated.

By the length, thickness, and, above all, the double flexion of the horns, the condoma approaches very near the *strepsiceros* of Caius; the shape and contours of the horns are exactly the same, and from which it seems reasonable to presume that they are the same animal, especially if we attend to the following reflections: first, Caius was evidently deceived in considering this animal as the strepsiceros of the ancients; for the strepsiceros of the ancients is certainly the antelope, whose head is very different from that of the stag; while Caius affirms, that the head of his strepsiceros is like that of the stags, therefore his strepsiceros is not the same as that of the ancients. Secondly, the horns of the animal Caius describes, are thick, more than three feet in length, covered with rugosities, and not with rings or tubercles; while those of the strepsiceros of the ancients, or antelope, are much thinner and shorter, and are furnished with rings and tubercles. Thirdly, although the horns of the condoma, which is in the Marquis de Marigny's cabinet, as well as those which came from the wardrobe of the king, have been polished and used, it is, nevertheless, plainly perceivable, that they never had rings; this is farther demonstrated by the horns M. Baurhis gave to me, which had never been polished, and yet it was rough, like the horns of the he-goat, and not annulated like those of the antelope ; besides, Caius himself says, that the horns of his strepsiceros had only rugosities, therefore his strepsiceros is not the same as that of the ancients, but the animal here spoken of, and which, in fact, is furnished with every character Caius has given to that which he describes.

In looking over the works of travellers for those marks which might have an affinity with the remarkable size of the horns of this animal, we can find none that have a nearer relation to it than those of the animal mentioned by Kolbe, under the name of the *wild goat* of the Cape of Good Hope. "This goat, says he, to which the Hottentots have not as yet given a name, and which I call the wild goat, is remarkable in many respects; it is about the size of a large stag; its head is very handsome, ornamented with two smooth crooked and pointed horns, about three feet long, and at their extremities about two feet asunder." These characters appear perfectly to agree with the animal in question; but having seen no more than the head, we cannot affirm that the rest of Kolbe's descriptions equally agrees with it; we, therefore, can only presume it as a probability, which requires confirmation by future observations. Kolbe remarks, that "All along the back there runs a white stripe, which ends at the insertion of the tail; another of the same colour crosses this at the bottom of the neck, which it entirely surrounds; there are two more which surround the body, the one behind the fore legs and the other before the hind ones. The colour of the rest of the body is grey, with some reddish spots, except the belly, which is white; it has also a long grey beard, and its legs, though long, are well proportioned."

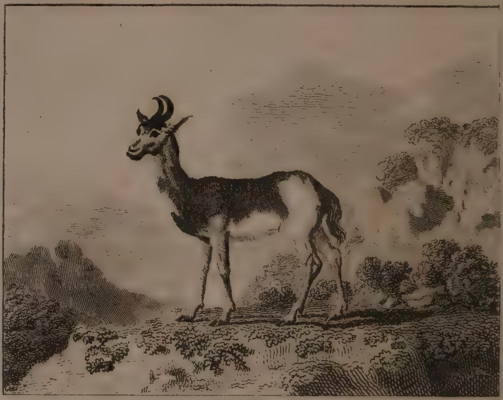

FIG.155

Nanguer

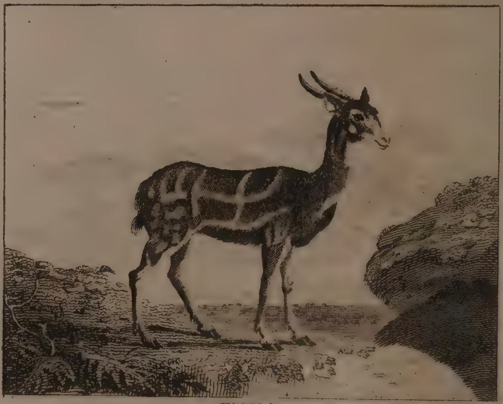

FIG.156

Guib

THE GUIB.

THE Guib (*fig*. 156) is an animal, which, though not noticed by any naturalist or traveller, is very common in Senegal, from whence M. Adanson brought over some of their skins. It resembles the gazelles, especially the nanguer, in the size and shape of its body, in the fineness of its legs, in the form of its head and muzzle, in the eyes and ears, in the length of its tail, and by the want of a beard; but every gazelle, especially the nanguer, has the colour of the belly white, while the breast and belly of the guib are of a deep brown. It also differs from the gazelles in the horns, which are smooth, without annular prominences, and have two longitudinal ridges, the one above and the other underneath, forming a spiral twist from the base to the point; they are also a little compressed. In these particulars the guib is more like the goat than the gazelle, nevertheless it is neither the one nor the other, but rather an intermediate species. It is also remarkable for white stripes on a brown ground, that are disposed along and across the animal's body, as if it were covered with a harness. It is a gregarious animal, and they are found in numerous herds in the plains of Podor.

THE GRIM.

THIS animal is only known to naturalists by the name of *Grimm*, or the *Wild Goat of Grimmius;* and which, as we were not acquainted with the name it bears in its own country, we shall adopt. We find a figure of this animal in the German Ephemerides, which has been copied in the Academical Collection. Dr. Herman Grimmius was the first who mentioned this animal, and what he said of it has been copied by Ray, and afterwards by all the nomenclators. Although his description* is incomplete;

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* This animal, on the back and neck, is of a dark ash colour, with a white belly, and is about a foot and a half in height; on the top of its head between the horns is a tuft of black hair, and between each eye and the nostrils, there is a cavity filled with a yellow humour, oily, and viscid, which has some resemblance to castor, and musk, and fills again upon the cavities being emptied. *Grimmius.*

complete, he denotes two characters so remarkable, that we can have no doubt that the head of an animal of Senegal, given us by M. Adanson, belongs to the goat of Grimmius. The first is a very deep cavity under each eye, so deep, indeed, as to leave but a thin partition of bone between the cavities and the partition of their nose; the second is a tuft of hair standing upright on the top of the head. These are sufficient to distinguish the grimm from every other goat or gazelle. It resembles both, however, not only in the shape of its body, but even in its horns, which are annulated towards the base, and have longitudinal streaks like those of the gazelles; at the same time, they are very short, and bend backwards in a horizontal direction, like the small African goat before mentioned. Besides, from being much smaller, and from having short horns, we are almost led to conclude that this animal forms the shade between the goat and small antelopes.

There is some reason to think, that the male grimm is alone furnished with horns; for the individual of which Dr. Grimmius has given the description and figure, had no horns: and the head which M. Adanson has given us was, on the contrary, ornamented with two, very short, and almost concealed by the hair, but yet sufficiently visible not to escape the notice of the observer; besides, we shall find, in the history of the chevrotains or small antelopes, that in the chevrotain of Guinea, the male only has horns, whence it is presumable, that it is the same with the grimm species, which in every respect approaches nearer the chevrotain than any other animal.

SUPPLEMENT.

IN the year 1777, M. Vosmaër published a description of this animal, which he calls the *Small Beautiful Buck of Guinea*, and from whom we have extracted the following account. "This was one of the most beautiful animals I ever saw; it was sent from Guinea with thirteen others of both sexes, but twelve of them died in their voyage to Holland, and those two which survived were males; these were put into the menagerie of the Prince of Orange, and one of them died the following winter, 1764. They are remarkable timid animals, and are much frightened at any noise, especially at thunder. When they are suddenly surprised, they express their fear by whistling strongly with their nose. The one now living, (in 1766) though very wild at first, is now so familiar, that upon holding a piece of bread to him, and calling him by the name they have given him of *tetje*, he will not only approach but allow himself to be stroaked. He is a particularly clean animal, and will not suffer the smallest piece of dirt to remain on any part of his body, but is constantly scratching himself with his hind feet. He is very active, and when standing still, keeps one of his fore-legs rather in a bent position, which gives him a graceful appearance. He eats bread, rye, carrots, is fond of potatoes, and is a ruminating animal. His horns are rather large in proportion to his size, and he has a small quantity of hair between them which he rises to a point. He is about the size of a young kid of two months old, and his limbs are extremely well proportioned. His head somewhat resembles that of a roe-buck; his nose is black and naked, but always moist; his upper lip appears as if divided; he has no beard but a kind of small whiskers on the sides, and a wart covered with hair under his chin; his horns are black, about three inches long, quite straight, and end with a sharp point; they are furnished with three rings, which rise a little backward; from the black tuft between the horns, there is a stripe of that colour down to the nose; his ears are large, with some short hairs on the insides, and on the tops, but all the other parts of them are black and naked; the eyes are large, and of a deep brown, between the eyes and nose there are black cavities, from the middle of which a viscid gummy humour exudes, that soon becomes hard and black, but I could never perceive that it contained that odour which Dr. Grimmius and those who have followed him, describe it to possess; the upper part of the neck and the head are of a yellowish grey, the back black, the sides a bright brown, the belly grey, and the limbs white as far as his knees; his legs have a black band, and the hair becomes blackish towards the hoofs; he had no heels, his feet were cloven, he had beautiful black pointed hoofs, and his tail was very short and white, with a black band on the upper part."

THE CHEVROTAINS.

WE have given the name of *Chevrotain* (*tragulus*) to the small animals of the warm regions of Africa and Asia, which almost every traveller has mentioned by the denomination of the *little stag*, or *little hind*. In fact, the chevrotain is a miniature resemblance of the stag, from the shape of its muzzle, lightness of its body, shortness of tail, and form of its legs; but differs greatly in size, the largest never exceeding that of the hare. Some of them are entirely without horns, and those which have any, are hollow, annulated, and nearly resemble those of the gazelles. Their small cloven foot, is also more like that of the gazelle than of the stag; and they differ both from the gazelle and the stag, by not having any depressions or hollows under their eyes: in that particular they approach the goat, but in reality they are neither stags, gazelles, nor goats, but constitute one or more distinct species. Seba gives the figures and descriptions of five chevrotains. The first he calls the *little red Guinea hind without horns;* the second, *the fawn, or the young delicate stag of Africa;* the third, *the little young stag of Guinea*; the fourth, *the little red and white hind of Surinam;* and the fifth, *the red-haired African stag*. Of these five chevrotains, the first, second, and third, are evidently the same animal; the fifth, which is larger than the three first, and whose hair is much stronger, and of a deep yellow, seems to be only a variety of the first; the fourth, which the author mentions as an animal of Surinam, appears to be only a second variety of this species, which is found only in Africa and the southern parts of Asia; and I am greatly inclined to think that Seba was misinformed, when he says this animal came from Surinam. Every traveller, who speaks of these little stags, mentions them as being found in Senegal, Guinea, and the East Indies; but not one affirms that he has seen them in America; and if the spotted chevrotain which Seba speaks of, did really come from Surinam, we must presume that it had been transported from Guinea, or from some other southern province of the old continent. But there appears to be a second species of chevrotain, different from all those we have mentioned, which seem to be only simple varieties of the first. This second species has small horns, not more than an inch in length, and the same in circumference: these horns are hollow, black, somewhat crooked, very sharp at the points, and surrounded at the bottom with two or three transverse rings. We have seen the feet and one of the horns of this animal in the royal cabinet, which sufficiently demonstrate it is either a chevrotain or a very small gazelle. Kolbe, speaking of this animal, says, it has horns like those of the stag, and that the branches were in proportion to their age; this is an evident error, which a single inspection of the horns will clearly prove.

These animals are of an elegant make, and their limbs finely proportioned for their size. But though they leap and bound with prodigious swiftness, yet, apparently, they cannot continue it long, for the Indians often hunt and frequently knock them down with their sticks: they are greatly sought after on account of the superior excellence of their flesh.

By comparing the different testimonies of travellers it appears, first, that the chevrotain without horns is peculiar to the East Indies; secondly, that the one with horns is the chevrotain of Senegal, and which is called *guevei* by the natives; thirdly, that only the male *guevei* is furnished with horns; fourthly, that the chevrotain marked with white spots, and which Seba says comes from Surinam, is, on the contrary, a native of the East Indies, especially of Ceylon, where it is called *memina*, (*fig*. 158) and we must therefore, conclude, that there are but two kinds of chevrotains, namely, the *memina*, (*fig*. 157) or the Indian chevrotain without horns; and the *guevei*, or Guinea chevrotain with horns; that the five species spoken of by Seba are only varieties of the memina; and that the smallest kind, which in Senegal is called *guevei-kaior*, is only a variety of the guevei.

These little animals can only live in excessive hot climates; they are so exceedingly delicate that it is with the greatest difficulty they are transported into Europe alive, where they perish in a short time. They are gentle, familiar, and very beautiful. They are, unquestionably, the smallest of all cloven-footed animals. According to this character of being cloven footed, they should not bring forth many young; but if we reason from their small size they should produce several at a litter. As to the fact on this point we must wait until opportunity is procured to make the observation; we are inclined to think they bring forth but one or two at a time, like the gazelles, roebucks, &c. but possibly they produce more frequently, for they are exceedingly numerous in India, Java, Ceylon, Senegal, Congo, and in every other country that is excessively hot, but are not to be found in America, nor in any of the temperate climates of the old continent.

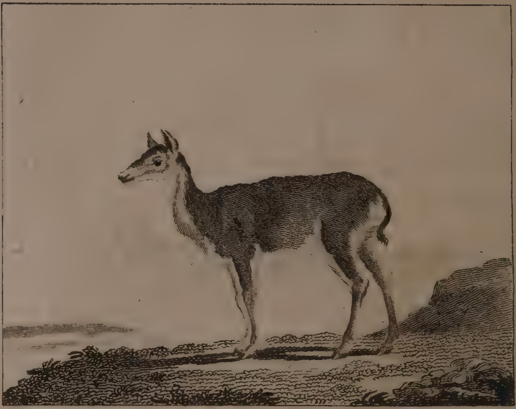
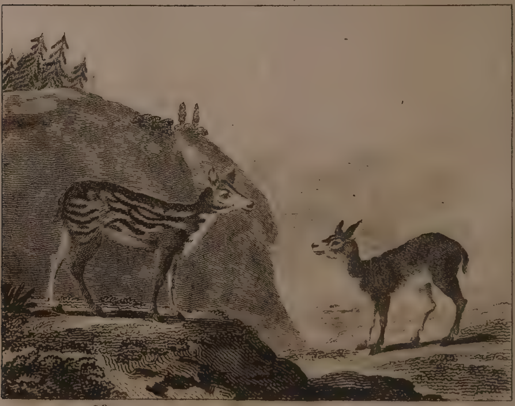


FIG.159
Cariacou



158 FIG. 157
Dº of Ceylon *Memina*

THE MAZAMES.

MAZAME, in the Mexican language, was the name of the stag, or rather a generic name, including the whole race of stags, fallow-deer, and roe-bucks. Hernandes, Recchi, and Fernandes, who have transmitted this name to us, distinguish two species of mazames, both common in Mexico and New Spain. The first and largest, to which they give the simple name of *mazame*, has horns like those of the roe-buck of Europe, that is, about six or seven inches in length, with the extremities divided into two points, and a single antler. The second, called *temamaçame*, is much less, and has but a single horn, and without any antlers. These two animals seem to be roe-bucks, the first being the same species as the European roe-buck, and the second only a variety of it. It also appears, that these mazames and temamaçames of Mexico are the same as the *cuguacu-apara*, and the *cuguacu-été* of Brasil, and that in Cayenne the first is called *cariacou*, (*fig.* 157) or the forest hind; the second, *the small cariacou*, or *the hind of the marshes*. Though we are the first who have pointed out these relations, yet we should not have presumed that there were either difficulties or doubts on this subject, if Seba had not mentioned the mazame and the temamaçame as two different animals: they are not roe-bucks with solid and branched horns, but gazelles with hollow and wrinkled ones: they are not animals of New Spain, as this author describes them, but natives of Africa. These errors of Seba have been adopted by most authors who have written since. They have not suspected that the animals mentioned by Seba, under the names of mazame and temamaçame, were the same as those mentioned by Hernandes, Recchi, and Fernandes. The confusion of the names has been followed by a confusion of the animals, and, in consequence, some naturalists have indicated these animals by the name of chevrotains, and others by that of gazelles, or goats. It appears that Linnæus suspected this error, for he has not adopted it. He has placed the mazame in the list of stags, and has thought, as we do, that the Mexican mazame is the same animal as the cuguacu of Brasil.

To demonstrate what we have advanced, we will suppose that there were neither gazelles, nor chevrotains, in New Spain, or in any other part of America, and that all those, as well as goats, which are at present there, have been carried from the old continent; that the true mazame of Mexico is the same animal as the cuguacu-apara of Brasil; that the name *cuguacu* is pronounced *couguacou;* and that, by corruption, this animal is called *cariacou* at Cayenne, from whence we had a living one sent us by this name of *cariacou.* We shall now endeavour to find out what species of animals these may be to which Seba has applied the names mazame and temamaçame, for to destroy an error it is not sufficient to reject it, but we should also explain the cause and demonstrate the effects.

The gazelles and chevrotains inhabit only the hottest countries of the Old World; they cannot exist in temperate climates, and still less in those that are cold. They could not, therefore, have ever frequented the northern countries, and have passed, by that means, from one continent to the other; nor have any travellers or historians of the New World, ever pretended to have seen them in that part of the globe. On the contrary, stags and roe-bucks, which inhabit cold and temperate climates, might have passed over the northern lands, and therefore are met with in both continents. We have observed, in our history of the stag, that the Cardian stag is the same as that of Europe; that he is only smaller, and has some slight variations in the shape of his horns and the colour of his hair. We may add, to what has been already said, that in America there are as many varieties among stags as in Europe, notwithstanding which they are of the same species. One of these varieties is the Corsican stag, which is smaller and browner than the common kind. We have also mentioned white stags, and hinds, and have said, that this colour proceeds from their domestic state; this kind is also found in America, as well as our common and small brown stags. The Mexicans, who keep these white stags in their parks, have denominated them *Royal Stags*. It is a native of Germany, and commonly called the *Stag of Ardennes;* and *Brandhirts*, by the Germans: it is at least as big as the large French stags, but differs from them by several particular characters. Its coat is thicker, and of a lighter colour under its belly: is throat and neck is furnished with long hairs, like the he-goat, which has caused both ancients and moderns to give it the name of *tragelaphus*, or *stag-like goat*. There are also a great number of roe-bucks in America: we are only acquainted with two varieties in Europe, the red and the brown; the latter are smaller than the former, but they perfectly resemble each other. The mazame of Mexico, the cuguacu-apara of Brasil, and the cariacou, or forest hind of Cayenne, entirely resemble our red roe-bucks. Comparing the descriptions given of them is a sufficient proof, that all these names denote the same animal. But the temamaçame, which we suppose to be the cuguacu-été of Brasil, the small cariacou of Cayenne may be a variety different from those of Europe. The temamaçame is less, and whiter on the belly than the mazame, in the same manner as our brown roe-buck has a whiter belly, and is smaller than our red one; it seems also to differ by the horns, which is single and without antlers in the figure given by Recchi; but if we consider that our roe-bucks, and stags, have no antlers in the first, and sometimes even in the second year of their age, we shall be inclined to think, that Recchi's temamaçame was too young to have antlers: these two animals, therefore, appear to be only simple varieties in the roe-buck species.

It now remains to enquire what these two animals, mentioned by Seba, by the false names of *mazame* and *temamaçame* really are. The bare inspection of the figures, independently of his description, demonstrates, that these animals belong to the goats or gazelles, and not to the stags or roe-bucks. The want of a beard, and the shape of the horns, prove, they are not goats, but gazelles; and, by comparing Seba's figures with the gazelles which we have described, I found that his pretended *temamaçame of New Spain*, is the *kob*, or *little brown cow of Senegal*. The figure, colour, and size of the horns are the same; the colour of the hair is also the same, and differs from that of other gazelles, by not being white, but yellow under the belly and upon the flanks. With respect to the pretended mazame, although it resembles the gazelles in general, yet it differs in particular from all those we have before enumerated; but we saw in M. Adanson's cabinet, where he has collected the most rare productions of Senegal, a stupid animal which we call *nagor*, by reason of the resemblance of its horns with those of the nanguer. This animal is found in the neighbouring island of Goree, from whence he was sent to M. Adanson by M. Andriot, and possesses all the characters which Seba gives to his pretended mazame; its body is of a pale red, and its belly is not white, like the other gazelles; it is of the size of the roe-buck; its horns are not six inches long, almost smooth, and slightly bent forwards, but not so much as those of the nanguer. Therefore this animal, mentioned by Seba, by the name of *mazame*, or *American stag*, is only an African goat, or gazelle, which we have added here by the name of the *nagor* to the twelve other gazelles, whose history we have already given.

THE COUDOUS.

THE class of ruminating animals is, of all others, the most numerous and the most varied. It contains, as we have seen, a great number of species, and, perhaps, a still greater number of distinct races, or constant varieties. Notwithstanding all our enquiries, and the considerable details into which we have been obliged to enter, we freely confess, that we have not exhausted the subject, and that there still remain even very remarkable animals which we are only acquainted with by imperfect fragments, and are unable to ascertain with precision to what class they belong. For example, in the very great collection of horns in the royal cabinet, as well as those dispersed in private museums, each of which, after much labour, and a multiplicity of comparisons, we have referred to the animal it belonged; there still remained one without label, or any mark affixed to it, absolutely unknown. This horn is large, almost straight, and composed of a very thick black substance; it is not solid, like that of the stag, but resembles that of the ox. From the base to beyond the middle of the horn is a thick ridge, raised about an inch; and although the horn is straight, this prominent ridge makes a spiral turn and a half in the interior part, and is wholly effaced in the superior part of the horn, which terminates in a point. This horn, which differs from every other, seems to have the nearest affinity to that of the buffalo; but we were ignorant of the name of the animal to which it belonged; and it was not till hunting through the different cabinets that we found in that of M. Dupleix part of a head adorned with two similar horns, and to which was affixed a label with these words: "*the horns of an animal nearly like a horse, of a greyish colour; with a mane on the fore part of its head like a horse; it is called at Pondicherry* coësdoës, *which should be pronounced* coudous." This little discovery gave me great pleasure; but I have not been able to meet with this name of *coesdoes*, or *coudous*, in the writings of any traveller; the label only has informed us that it is of a large size, and to be met with in the hottest countries of Asia. The buffalo is of the same climate, and has likewise a mane; it is true his horns are crooked and flat, while those of the coudous are round and straight, which, together with the colour, are sufficient indications of the difference of these two animals; for the buffalo has a black skin and hair, and, according to the label, the hair of the other is grey. These relations suggest others: the travellers in Asia speak of the large buffaloes of Bengal, of red buffaloes, and of the grey buffaloes of the Mogul empire, which are called *nil-gauts*; the coudous may possibly be one or other of these animals, and the travellers into Africa, where the buffalo is as common as in Asia, more precisely mention a species of buffalo, called *pacasse* at Congo, which from their indications seems to be the coudous. "In the route from Louanda to the kingdom of Congo*, we perceived two pacasses, which are animals resembling buffaloes, and which roar like lions. The male and female go always together; they are white, spotted with red and black; their ears are about half an ell long, and their horns are perfectly straight: they neither fly at the sight of the human species nor do any injury, but only stare at them as they pass along." We have before mentioned, that the animal, called at Congo, empacassa, or pacassa, appeared to be the buffalo. It is, in fact, a kind of buffalo, but differs from it by the shape of the horns and the colour of the hair; in one word, the pacassa is the coudous, which perhaps forms a separate species from that of the buffalo, and perhaps, also, may only be a variety of it†.

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* Relation de Congo, par les PP. Michael-Ange de Galline et Denys de Charly de Plaisance, Capuchins.

† The coudous is from five to eight feet in height. The body is of a bluish ash colour, with a black mane. The head is reddish; the tail is black at its extremity, and terminated by a little tuft. Both sexes have horns. They are of a deep black colour, and two feet in length. The Hottentots make tobacco pipes of them. Their flesh is excellent.

THE MUSK.

TO finish the history of goats, gazelles, chevrotains, and other animals of this genus, which are all found in the old continent, it only remains to give that of the Musk, an animal as famous as it is unknown. This is the animal which produces the real musk; all modern naturalists, and the greatest part of travellers through Asia, have mentioned it, some by the name of a stag, a roe-buck, or a musk-goat, and others have considered it as a large chevrotain. It seems indeed to be of an ambiguous nature, participating of all the above animals, yet at the same time we can assert, that its species is different from all other quadrupeds. It is about the size of a small roe-buck, but its head is without horns, and by this character it resembles the *memina* or *chevrotain* of India. It has two great canine teeth or tusks in the upper jaw, and by this it approaches the *chevrotain* of India; but what distinguishes the musk from all other animals is a kind of bag about two or three inches in diameter, which grows near the navel, and in which the liquor, or rather the greasy humour called musk is secreted, and which differs from that of the civet both in smell and consistence. Neither the Greeks nor Romans mention the musk animal. The first that noticed it were the Arabs. Gesner, Aldrovandus, Kircher, and Boym have given more extended accounts of this animal; but Grew is the only person who has made an exact description of it, from a skin which was preserved in the cabinet of the Royal Society of London. His description is as follows:—"The musk stag is about three feet six inches in length, from the head to the tail; the head is about half a foot long; the neck seven or eight inches; the fore part of the head three inches broad, and the nose sharp like that of a greyhound; the ears are erect, like those of a rabbit, and about three inches long; the tail is not above two inches; the fore-legs, including feet and thighs, are thirteen or fourteen inches long; he is cloven-footed, armed on his fore-feet behind and before with two horny substances: the hind feet were wanting. The hair of the head and legs about half an inch long, and very fine; thicker under the belly, and an inch and a half in length; on the back and crupper they are three inches, and three or four times thicker than the bristles of a hog, of course more so than that of any other animal. It is brown and white alternately, from the root to the point; on the head and thighs it is brown; under the belly and tail white; a little curled, especially on the back and belly; it is very soft, and has the appearance of being something between a common hair and a quill; on each side of the lower jaw, under the corners of the mouth, there is a small tuft of thick hair, which is short and hard, about three-fourths of an inch long, and somewhat resembling the bristles of a hog. The bladder, or bag, which contains the musk is about three inches long, two broad, swells out from the belly about an inch and a half, and stands near as much before the groin. The animal has twenty-six teeth, sixteen in the lower jaw, of which the eight in front are incisive, the four grinders behind, are rugged and continuous, and as many similar grinders in the upper jaw. There is also a tusk about two inches and a half long on each side in the upper jaw, which terminate in the form of a hook, not round but flat, and have a sharp edge behind. They have no horns, &c.*"

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* Grew's Museum.

In 1681, a year after Grew's publication, Luc Schrockius printed a history of this animal at Vienna, in which we do not find any thing very exact, nor absolutely new. We shall, however, select such facts as may be collected from it, and which agree with those in other authors, and especially in the works of the more modern travellers. We have been under the necessity of contenting ourselves with collecting what has been said of this animal, which we have never seen, and which we have not been able to procure. By Grew's description, which is the only authentic work we can rely on, it appears, that the hair of this animal is long and rough, the muzzle pointed, and the tusks somewhat like those of the hog: in these characters it approaches the boar kind, or perhaps still more the babiroussa, which the naturalists have denominated the *Indian boar;* and which, though resembling the hog in many characters, like the musk animal, he is much smaller, and has longer and slender legs, like those of the stag or roe-buck. On the other hand, the American hog, which we have called *pecari*, has a bag, or cavity, on its back, containing an odoriferous humour. The musk animal has a similar bag, not on his back, but under the belly. In general, those animals which produce odoriferous liquors, as the badger, the beaver, the pecari, the musk-rat, the civet, the zibet, are not of the stag or goat genus: thus we might be tempted to think, that the musk animal is nearer the hog kind, of which he has the tusks, if he had, at the same time, incisive teeth in his upper jaw; but his deficiency in that respect, makes him come nearer the ruminating animals, and especially the chevrotain, which ruminates, though it has no horns; but all these external indexes can only furnish us with conjectures. It is the inspection of the internal parts alone that can decide the nature of this animal, which is not even as yet perfectly known; nor have I placed him after the goats and antelopes from any conviction or even reason to conclude he belongs to those species.

Marco Polo, Barbosa, Thevenot, and Marini, are all more or less deceived in the characters they have given of this animal*. The only true point in which they agree is, that the musk is formed in a bag, or tumour, near the navel, and it appears by their testimonies, as well as those of other travellers, that the male only produces the musk; that the female has a similar bag near the navel, but that the humour which gathers there, has not the same smell; that this tumour of the male is only filled with musk at the rutting-time, and that at other times the quantity of this humour is less, and the odoriferous scent much weaker.

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* There exists in fact, says Sonnini, a variety of the musk animal which is entirely white It is however very rare. Pallas saw a female of this variety which came from the country of the Abakanks. *See Pallas, vol. iv. p.* 14.

In respect to the musk itself, its essence, or pure substance, is, perhaps, as little known as the nature of the animal which produces it. All travellers agree, that the musk is always mixed and adulterated with blood, or some other drugs, by those who sell it. The Chinese not only increase the quantity by this mixture, but they endeavour likewise to increase the weight, by incorporating with it lead very finely ground. The purest musk, and that which is the most sought after, even by the Chinese themselves, is that which the animal deposits upon trees or stones, against which he rubs himself when the quantity becomes too great, or renders the pouch uneasy. That which is found in the bag is seldom so good, because it is not fully ripe, or because perhaps it is only in their rutting season that it acquires all its strength and smell; and that it is at this time the animal endeavours to disburthen himself of a matter which then causes violent itchings, and possibly some degree of pain.

Chardin and Tavernier have both described the means, which the eastern nations make use of to adulterate the musk*: the merchants must necessarily increase the quantity of it beyond conception, since in one year Tavernier purchased 1673 bags, which supposes an equal number of animals to have been taken. But as this animal is no where domestic, and as the species is confined to some few provinces of the East, it is impossible to be sufficiently numerous to produce so great a quantity of this matter. We cannot, therefore, doubt the greatest part of these pretended bags, or bladders, are only artificial ones made of the skin of the other parts of the animal, and filled with its blood, mixed with a very small quantity of true musk. Its scent is, in fact, the strongest of any yet known; a single grain is sufficient to perfume a great quantity of other matter; the odour of the smallest particle will perfume a considerable space; and the perfume itself is so permanent, that at the end of several years it does not seem to have lost much of its power.*

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* It is said that when the animal is taken, and the musk bag first opened, that the odour is so strong the hunter is obliged to have several folds of linen over his nose and mouth, and that even then it sometimes proves fatal. I am inclined to believe this is true, because the musk decreases in strength with time, and when I dealt in that article, I always found it requisite to stand in the open air, and at a distance from those who moved the bladders. This drug is, however, very frequently adulterated by the hunters with the blood of the animal, and by the merchants with the blood of oxen, lead, &c. But the natives of India have various methods of detecting this adulteration, they discover it by the taste, and weight, but mostly with a thread steeped in the juice of garlic which they draw through the bag with a needle, and if it retains that smell they are certain of its being adulterated. *Voyage de Chardin.*

THE BABIROUSSA.

ALTHOUGH we have only the head of this animal in the royal cabinet, it is too remarkable to be passed over in silence. All naturalists have looked upon it as a kind of hog, though neither its head, size, bristles, nor tail, resemble that animal: its legs are longer, and its muzzle shorter; it is covered with short hair, as soft as wool, and its tail is terminated by a tuft of this wool; its body is likewise not so thick and clumsy as that of the hog; its hair is grey, mixed with red and a little black; its ears are short and pointed; but the most remarkable character, and which distinguishes it from all other animals, are four enormous tusks,

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* The musk is a solitary animal, which prefers high mountains and rugged rocks; sometimes he descends into the profound and dark chasms which separate the highest chains of mountains, and sometimes he climbs to their tops covered with snow. He is very agile, and swims very well; extremely ferocious, it is difficult to approach him, and equally so to tame him, though mildness forms the basis of his character. He is in rut in the months of November and December; this season of love is also the season of furious combats between the males. They eat the flesh of this animal: but that of the young ones alone is good and tender.

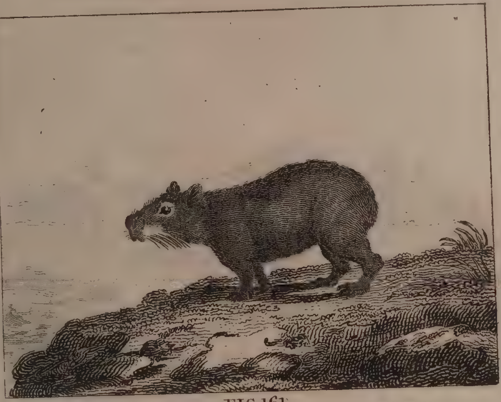

FIG.161
Cabiai

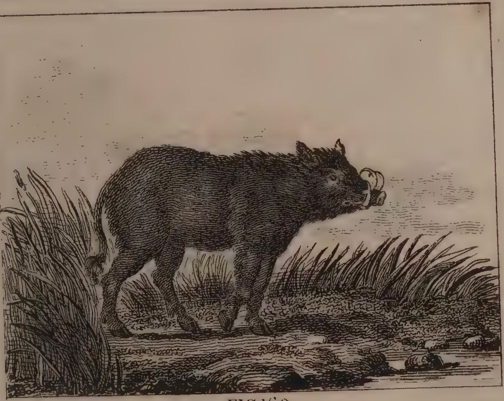

FIG.160
Babiroussa

tusks, or canine teeth, the two shortest of which shoot out of the lower jaw, like those of the wild boar, and the two others, which come from the upper jaw, pierce the cheeks, or rather the upper part of the lips, and rise in a curve almost to the eyes. The tusks are a very beautiful ivory, much smoother and finer, but not so hard as that of the elephant.

The position and the direction of these two upper tusks, which rise upright, and then bend in the form of a circle, have made some skilful naturalists, such as Grew, imagine that these tusks ought not to be looked upon as teeth, but as horns. They founded their opinion upon the circumstance that in all animals the sockets of the teeth in the upper jaw open downwards; that in the babiroussa, as in the other animals, the sockets are turned downwards, except those of these two great tusks, which, on the contrary, are turned upwards; and they concluded from thence, that from this essential character of the upper teeth, these tusks, whose sockets are directed upwards, ought to be looked upon as horns and not as teeth. But these philosophers were deceived; the position or direction is only a circumstance, and not essential to the existence of an object. These tusks, though situate in an opposite manner to that of the other teeth, is only a singularity in the direction, which cannot change the nature of the thing, nor make an ivory horn of a true canine tooth.

These enormous tusks give this animal a very formidable appearance; they are, however, less dangerous than our wild boars. They go in herds, and have a very strong smell, by which they are easily discovered, and are hunted by dogs with good success. They growl terribly, defend themselves, and wound their enemies with their under tusks; for the upper are rather of disservice than of use to them. Although savage and ferocious, they are tamed with great ease; and their flesh, which is very good, putrifies in a short time. As their hair is fine, and their skin delicate, it is soon penetrated by the teeth of dogs, who hunt them in preference to wild boars, and sooner accomplish their purpose. They fasten their upper tusks in the branches of trees, to rest their heads, or to sleep standing. This habit they have in common with the elephant, who, in order to sleep in a standing posture, supports his head by fixing the end of his tusks in the holes which he makes in the walls of his lodging.

The babiroussa differs still more from the wild boar, by his natural appetites; he feeds upon grass and leaves of trees, and does not endeavour to enter gardens to feed on beans, pease, and other vegetables; while the wild boar, who lives in the same country, feeds upon wild fruit, roots, and often destroys the gardens. Besides, these animals who go together in herds, never intermix; the wild boars keep on one side, and the babiroussas on the other. The latter walk quicker and have a very fine smell, and often stand erect against the trees to scent the approach of dogs or hunters. When they are pursued to any great distance they make towards the sea, and, swimming with great dexterity, very often escape their pursuers, for they swim for a long time, and often to very great distances, and from one island to another.

The babiroussa is found not only in the island of Bouro, or Boero, near Amboyna, but also in many parts of the South of Asia, and Africa; as at Celebes, Estrila, Senegal, and Madagascar, for it appears that the wild boars of this island, which Flaccourt speaks of, and says, *that the males chiefly have two horns on the side of their nose*, are babiroussas. We have not had it in our power to determine whether the female has the two tusks which are so remarkable in the male, but most authors seem to agree that they have.

SUPPLEMENT.

HAVING been favoured with two drawings of this animal, we are now enabled to present a figure of the Babiroussa, (*fig.* 160) and which we believe will give a tolerable idea of him, since it was taken with much care, and is a combination of both; the one of them we received from M. Sonnerat, which represented him in a standing posture, and the other lying on its belly, was sent us from England by Mr. Pennant, with the following label; " a Babiroussa from the island of Banda, drawn from nature;" it is of a blackish colour, grows to the size of a large hog, and its flesh is very good to eat.

THE CABIAI.

THIS American animal had never been seen in Europe until the Duke of Bouillon procured one to be sent to him from America. As this prince is curious in foreign animals, he has often done me the honour of inviting me to see them; and he has even given me several species for the advantage of this work. This animal (*fig.* 161) was sent very young to him, and had not arrived at its full growth when the cold killed it. It is not a hog, as naturalists and travellers have pretended; it only resembles that animal by trifling marks, and differs from it by striking characters. The largest cabiai is scarcely as big as a hog of eighteen months growth. The head is shorter, and its mouth less; the eyes are larger, the number and form of the teeth are different, it wants a tail, and is web-footed; the hoofs before are divided into four parts, and those behind into three; between the divisions there is a prolongation of the skin, so that the feet, when opened in swimming, can beat a greater surface of water in which it frequently lives; it swims like an otter, seeks the same prey, and seizes the fish with its feet and teeth, and carries them to the banks to eat. It also eats fruits, corn, and sugar-canes. As its feet are broad and flat it often sits upon its hind ones. Its cry more resembles the braying of an ass than the grunting of a hog. It seldom stirs out but at night, and almost always in company without going far from the sides of the water. It can find no safety by flight, from the length of its feet and the shortness of its legs. To escape its enemies it plunges into the water, and remains at the bottom so long that the hunters lose all hopes of seeing it again. It is fat, and the flesh is tender, but, like that of the badger, it tastes more like bad fish than good flesh; the head, however, is not bad, and this agrees with what is said of the badger, his fore parts are pretty good, while his hind ones taste like fish.

The cabiai is quiet and gentle; it is neither quarrelsome nor savage with other animals. It is easily tamed, comes at call, and willingly follows those who feed and treat it with kindness. It was fed at Paris with barley, sallad, and fruit, and was healthy while the weather kept warm. By its number of paps we should suppose that the females produce several young at a litter. We do not know how long they go with young, the time of their growth, nor, consequently, their length of life. The natives, or colonists, of Cayenne might inform us of these particulars, for it is very common in Guiana, as well as in Brasil, in Amazonia, and in all the lower countries of South America.

SUPPLEMENT.

WE have been informed by M. de la Borde, that the Cabiai is a common animal in Guiana, and on the borders of the Amazon river; he says that the male and female always go together; that they avoid the habitations of men, and always live by the sides of rivers, into which they go whenever they are disturbed, swimming like hogs to a great distance, sometimes diving to the bottom, where they will remain a considerable time; that the natives frequently take them when very young, and bring them up in their houses, where they soon become familiar, and will eat bread, millet, and herbs, although they principally live on fish when in their wild state; that the females produce but one at a time; that they are perfectly harmless; and that their flesh is white and well tasted. Although this last fact may seem to contradict what we have formerly stated upon the authority of other authors yet it is by no means improbable that their flesh may be bad when in their wild state, from feeding on fish, and yet very good when they live on bread and grain.

As one of these animals lived some time in Paris I am of opinion they would propagate in our climate ; and the more especially as I find the one I formerly alluded to was not killed by the cold, but that the winter had no particular effect upon it. I have since been informed that this animal, was confined in an upper room, from the window of which it jumped, and falling into a vessel of water was drowned.

THE PORCUPINE.

THE name given this animal leads to a supposition that it is a hog covered with thorny quills,*when, in fact, it only resembles that animal by its grunting ; in every other respect it differs from the hog as much as any other animal, both in its outward appearance and interior conformation. Instead of a long head and ears, armed with tusks, and terminated with a snout ; instead of cloven feet, furnished with hoofs like the hog ; the porcupine has a short head like the beaver, two large incisive teeth in each jaw, no tusks or canine teeth, the

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* This may be said of it in reference to its French, Italian, and Spanish appellation, but not in regard to its English one. In German too, its name conveys this idea: *stachel-schwein* literally *swine with thorns.*

Engraved for Barrs Buffon

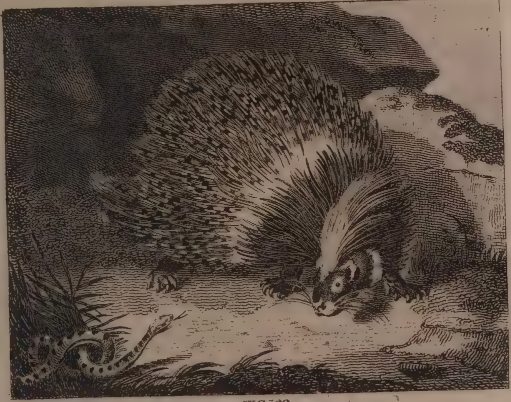
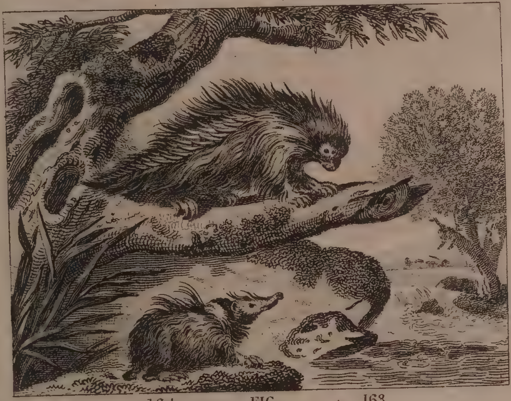


FIG.162

Porcupine



164 FIG. 163

Tendrac *Coendou*

the upper lip divided like that of the hare, the ears round and flat, and the feet armed with claws. Instead of a large stomach, with an appendix in form of a cowl, the porcupine has only a single stomach, with a large cæcum gut. The parts of generation are not apparent, as in the boar, and its testicles are concealed in the groin. By all these marks, together with its short tail, long whiskers, and divided lip it approaches more to the hare or beaver than to the hog. The hedge-hog, indeed, who, like the porcupine, is covered with prickles, somewhat resembles the hog, for it has a long muzzle, terminated by a kind of snout; but all these resemblances being so very slight it is clear that the porcupine (*fig.* 162) is a particular and different species from the hedge-hog, the beaver, the hare, or any other animal whatever.*

Travellers and naturalists have almost unanimously declared this animal has the faculty of discharging its quills, and with such force as to wound its foes at a great distance; and that these pricklyquills have the extraordinary property of penetrating farther into the flesh of their own accord and power, as soon as the point has made an entrance. This last circumstance is purely imaginary, without any foundation, and the first is as false as the second. The error seems to have arisen from this animal raising his prickles upright when he is irritated; and as some of them are only inserted into the skin by a small pellicle they easily fall off. We have had many living porcupines, but never saw them dart any of their quills, even though violently agitated. It is a matter of astonishment, therefore, that the gravest authors, both ancient and modern, as well as the most sensible travellers, should join in opinion respecting a circumstance so entirely false. Some affirm that they have been wounded by this sort of darting; others, assert that the quills are darted with such vengeance, as to pierce a plank at a great distance. The marvellous commonly is pleasingly believed, and increases in proportion to the number of hands it passes through. Truth, on the contrary, diminishes in the same degree; and in spite of the positive negative which I have placed on these two fictions, I am persuaded, that many future writers will assert that the porcupine darts his quills to a distance, and that when those quills are separated from the body of the animal, they will of themselves, and with their own exertions, penetrate deeper into those bodies in which the point has entered.

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* It is probable that the resemblance of the flesh of this animal with that of the hog has contributed more to his having the name which he bears, than any supposed exterior or interior affinities between them.

However, in justice to Dr. Shaw, we must except him from the number of these credulous travellers; "Of all the number of porcupines (says he) which I have seen in Africa, I have never yet met with one, who could dart their quills, however strongly he was irritated; their common method of defence is to lie on one side, and when the enemy approaches very near, to rise suddenly and wound him with the points of the other."

The porcupine, although originally a native of the hottest climates of Africa and India, lives and multiplies in colder countries, such as Persia, Spain, and Italy. Agricola says, that the porcupine had not been transported into Europe, much before his time. They are found in Spain, but more commonly in Italy, especially on the Appenine mountains, in the environs of Rome.

Pliny, and other naturalists, have said, after Aristotle, that the porcupine, like the bear, conceals himself during winter, and that they bring forth in thirty days. We have not had it in our power to verify these facts; and it is singular, that in Italy where this animal is common, and where there has ever been skilful philosophers and excellent observers of nature, that its history has never been written by any of them. Aldrovandus in speaking on this subject, has, like the rest, only copied Gesner; and the gentlemen of the academy, who have dissected eight of these animals, say very little that has any relation to their natural habits. We only learn from the testimonies of travellers, and persons who have kept them in menageries, that the porcupine in its domestic state, is neither savage nor furious, but only anxious for liberty; that with the assistance of its fore teeth, which are sharp and strong like those of the beaver, he easily cuts through his wooden prison. It is also known that he feeds willingly on fruits, cheese, and crumbs of bread; that in his wild state, he lives upon roots and wild grain; that when he can enter a garden he makes great havock*, eating the herbs, roots, fruit, &c. that he becomes fat, like most other animals, toward the end of summer;

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* The porcupine is a perfect scourge to the gardens of the Cape of Good Hope; he commits great ravages in the plantations of cabbage, and other kitchen herbs. The wild herb of which this animal is most fond, is the *Calla Ethiopica*, which however, is so acrid, according to Sparrman, that the root or the leaves applied to any part of the body will raise a blister.

mer; and that the flesh of this animal, although a little insipid, is tolerable eating.

When the form, substance, and organization of the prickles of the porcupine are considered, they are found to be tubes to which only vanes are wanting to make them real feathers. They strike together and make a noise as the animal walks; he can easily erect them in the same manner as the peacock spreads the feathers of his tail, and as easily smooths them again by the contraction of the cuticular muscle. This muscle, therefore, has the same power, and is nearly of the same formation in the porcupine as in some birds.

THE COENDOU.

IN every article we have to treat of we always meet with more errors to confute than facts to relate. This arises from the history of animals having been only written of late by prejudiced persons, who take the list of their little systems for the genuine register of Nature. There are not any animals of the warm climates of the old continent existing in America, and reciprocally there are not any of the South American animals to be met with under the torrid zone of Africa and Asia. The porcupine,

cupine, as already observed, is a native of the hot countries of the old world, and having never been found in the new, they have not hesitated to give his name to animals which seemed to resemble him, and particularly to that which we have now under consideration. On the other hand, the Coendou (*fig.* 163.) of America has been transported to the East Indies; and Piso, who probably was not acquainted with the porcupine, has made Bontius, who only speaks of animals in the southern parts of Asia, engrave the coendou of America under the name and description of the true porcupine; so that, at the first view, we should firmly believe, that this animal existed equally in America and in Asia. It is easy, however, to discover, with a little attention, that Piso, who is in this, as well as in most parts of his work, only a plagiarist of Marcgrave, has not only copied his figure of the coendou, into his history of Brasil, but has copied it again for the work of Bontius, of which he was the editor. Therefore, though we find the figure of the coendou in Bontius, we must not conclude, that it exists in Java, or in any other part of the East Indies, nor take this figure for that of the porcupine, which, in fact, the coendou only resembles by its quills or prickles.

It is to Ximenes, and afterwards to Hernandes, that we owe the first knowledge of this animal, which they have indicated under the Mexican name of *hoitztlacuatzin*. The *tlacuatzin* is the opossum and the *hoitztlaquatzin* should be translated the *bristly* or *spinous opossum*. This name has been misapplied, for these animals resemble each other very little. Marcgrave has not adopted this Mexican denomination, but calls this animal *cuandu*. The only thing we can reproach Marcgrave with, is his not having known, that the cuandu of Brasil was the same animal as the hoitztlacuatzin of Mexico, especially as his description and figure agree with those of Hernandes; and as Laët, the editor and commentator of Marcgrave expressly says, that the spiny tlacuatzin of Ximenes, and the cuandu, are probably the same animal. By collecting the scattered accounts of travellers there appears to be two varieties of these animals, which the naturalists, after Piso, have inserted in their lists as two different species, namely, the great and the little coendou: but what immediately proves the error, or negligence of Piso, is, that although he describes tnese coendous in two separate and distinct articles, and seems to look on them as different species, he represents both by the same figure:

which, we think, sufficient foundation to pronounce them the same animal. There are likewise other naturalists who have not only made two species of the great and little coendou but have also separated the hoitztlacuatzin, and given all three as different animals. I own, indeed, that although it is probable, the coendou and the hoitztlacuatzin are the same animal, yet this identity is not so certain as that of the great and little coendou.

However that may be, the coendou is not the porcupine. He is much smaller; his head and muzzle shorter; he has no tuft on its head nor is his upper lip divided; his quills are proportionally shorter and much finer; his tail is long, and that of the porcupine very short: he is carnivorous rather than frugivorous, and endeavours to surprize birds, small animals, and poultry, while the porcupine only feeds upon herbs, roots, and fruits. He sleeps all the day like the hedge-hog, and only stirs out in the night: he climbs up trees, and hangs on branches by his tail. All travellers agree, that his flesh is very good eating. He is easily tamed, and commonly lives in high places. These animals are found over all America, from Brasil and Guiana, to Louisiana and the southern parts of Canada; while the porcupine is only to be found in the hottest parts of the Old Continent.

By conferring the name of porcupine on the coendou, the same faculties have been attributed to him, especially that of shooting his quills. It is astonishing that naturalists and travellers should agree on this circumstance, and that Piso, who ought to have been less superstitious, as he was a physician, should gravely assert, that the quills of the coendou pierce into the flesh by their own power, and penetrate into the body even to the most internal viscera. Ray is the only person who has denied these circumstances, although they evidently appear to be absurd. How many absurdities have been exposed by men of sense, which, nevertheless, are affirmed by other men who think they are endowed with a greater degree of understanding!

SUPPLEMENT.

TO our former account of this animal we may now add that there are two species of it in Guiana, the one larger than the other; the former weigh from twelve to fifteen pounds, and the latter about six: their principal food is the leaves of trees, in the holes of which the females bring forth their young; they commonly bring forth two at a time, and yet they are not very numerous. The negroes are very fond of their flesh and describe it as extremely good. From the account of M. de la Borde they are solitary animals, except in the season of love, when they go in pairs; they seldom venture to appear during the day, and they find a most inveterate enemy in the tiger who destroys them at every opportunity.

THE URSON.

THIS animal has never yet received a distinct name: placed by Nature in the desert part of North America, it exists in independence far distant from man, and has not even received from him a name, which is the first mark of an animal's subjection. Hudson having discovered the country where he inhabits, we shall give him a name which has an affinity with his first master, and which, at the same time, indicates his sharp bristly nature. It was likewise necessary to give him a name, a name, that he might not be confounded with the porcupine or coëndou, which he resembles in some few characters, but so materially differs from them in other respects that he ought to be looked upon as a different species. He is also a native of the northern climates, while the others particularly belong to that of the south.

Edward, Ellis, and Catesby, have all spoken of this animal: the figures given by the two first agree with ours, and we have no doubt of their being the same animal. We are likewise strongly inclined to believe, that the figure and description Seba has given, under the name of *the remarkable porcupine of the East Indies*, and which afterwards Klein, Brisson, and Linnæus, indicated in their methodical lists by characters extracted from Seba, may be the same animal as we are now treating of. This would not, as we have already observed, be the only time that Seba has spoken of American animals as belonging to the East Indies. However we cannot be so positive with respect to this as we have been with many other animals; all that we can say is, that the resemblances appear to be very great, and the differences very slight, and that these differences may possibly be only varieties between individuals,

dividuals, or such as distinguish the males from the females.

The *urson* might be called the *bristly beaver*, he being of the same country, the same size, and the same form of body. He has, like the beaver, two long, strong, and sharp incisive teeth at the end of each jaw. Besides his prickles, which are short, and almost covered with hair, like the beaver, he has a double coat, the first consists of long and soft hairs, and the second of a down, which is still more soft and smooth. In the young ursons the prickles are proportionably larger, more apparent, and the hair shorter and scarcer than in the adults.

This animal avoids moist places, and is even fearful of wetting himself. They make their habitations under the roots of great hollow trees, sleep very much, and chiefly feed upon the bark of juniper-bushes. In winter the snow serves them for drink; and in summer they lap water like a dog. The savages eat their flesh, and strip the bristles off the hide, which they make use of instead of pins and needles, and clothe themselves with the fur.

THE TANREC AND THE TENDRAC.

THE *Tanrecs*, or *Tendracs*, are small animals of the East Indies, which resemble a little our hedge-hogs, but differ from them sufficiently to constitute a distinct species. This is strongly proved by its not rolling itself up in the shape of a ball, like the hedge-hog; and besides the tanrecs are found at Madagascar, where there are also hedge-hogs of the same species as ours, which are not called there tanrecs but *soras*.

There appears to be two species of tanrecs, or, perhaps, two different races; the first, which is nearly as large as our hedge-hog, has its muzzle proportionably longer than the second; its ears are also more apparent, and is more furnished with prickles than the second, to which we have given the name of tendrac to distinguish it from the first. The tendrac (*fig.* 164) is not bigger than a large rat; its muzzle and ears are shorter than those of the tanrec, which is also covered with shorter prickles, but they are as numerous as those of the hedge-hog; the tendrac, on the contrary, has them only on the head, neck, and withers, the rest of the body being covered with a coarse hair resembling the bristles of a hog.

These small animals, whose legs are short, move but slowly; they grunt, and wallow in the mire like hogs; they are chiefly in creeks and harbours of salt water; they multiply in great numbers, and dig themselves holes in the ground, whither they retire and sleep for several months. During this torpid state their hair falls off, which grows again upon their revival. They are usually very fat, and although their flesh is insipid, soft, and spongy, yet the Indians consider it as a very great delicacy.

THE GIRAFFE, OR CAMELOPARD.

THE Giraffe (*fig.* 165) is one of the tallest, most useful, most beautiful, and harmless animals in nature. The enormous disproportion of his legs, the fore ones being as long again as those behind, is a great obstacle to the exercise of his powers. His motion is waddling, slow, and stiff; he can neither fly from his enemies

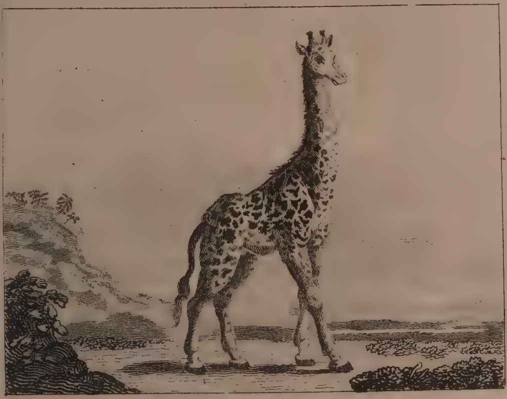
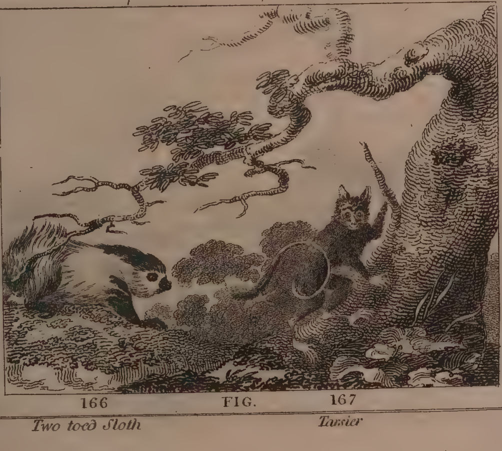


FIG.165

Giraſfe



166 FIG. 167

Two toed Sloth *Tarsier*

enemies in a free state, nor serve his master in a domestic one. The species is not very numerous, and has always been confined to the desarts of Ethiopia, and to some other provinces of Southern Africa and India. As these countries were unknown to the Greeks, Aristotle makes no mention of this animal. Pliny speaks of it, and Oppian describes it in a manner that is far from equivocal. "The camelopardalis (says this author) has some resemblance to the camel; it has a spotted skin like the panther, and a neck as long as the camel; its head and ears are small, its feet broad, and its legs long, but the last are very unequal, the fore ones being much longer than those behind, which are so short, that when the animal is standing it has somewhat the appearance of a dog sitting upon his posteriors. There are two prominences upon the head just between the ears, which resemble two small and straight horns. Its mouth is like the stag's; its teeth small and white; its eyes full of fire; its tail short, and furnished with black hairs at the end." By adding to this description of Oppian those of Heliodorus and Strabo, we shall have a sufficient idea of the camelopard. "The ambassadors of Ethiopia (says Heliodorus) brought an animal about the size of a camel, whose skin was speckled with beautiful and glossy spots, the hinder parts were much lower than the anterior; the neck was slender, although rising from a tolerably thick body; the head resembled that of the camel, and in size was scarce double that of the ostrich; the eyes appeared tinctured with different colours. The motion of this animal was different from that of all other quadrupeds, who in walking lift their legs diagonally, that is, the right leg before with the left leg behind; but the camelopard goes naturally in an amble, with its two right or its two left legs pacing together. It is a gentle animal, and may be conducted any where with a small cord tied round its head." "There is (says Strabo) a large animal in Ethiopia called *camelopardalis*, although it bears no resemblance to the panther, for its skin is not spotted in the same manner; the spots of the panther are circular, and those of this animal are long, and nearly resembling those of the fawn, or young stag. The posterior parts of its body are much lower than the anterior; so that towards the rump it is not higher than the ox, while its shoulders are higher than those of the camel. From this disproportion it cannot run very swift. This animal is gentle, does no injury, and feeds upon grass, leaves, and vegetables." Among the moderns, the first good description we meet with is that of Belon. "I saw (says he) an animal at the castle of Cairo, which is commonly called *zurnapa;* the Latins anciently stiled it *camelopardalis*, a name compounded of leopard and camel, for it is sprinkled with spots like the first, and has a long neck like the latter. It is a very beautiful animal, as gentle as a lamb, and more sociable than any other wild beast. Its head is almost like that of the stag, excepting its size; on it are two small horns, about half a foot long, covered with hair; those of the male are longer than those of the female. They both have ears as large as those of a cow, and the tongue black, like that of the ox; it has no incisive teeth in the upper jaw; its neck is long, straight, and slender; its horns round; its legs thin and long, but so low behind that the animal appears to be sitting; its feet are like those of the ox; its tail, which hangs down almost to its hoof, is round, and the hair on it is three times as thick as that of a horse; the colour of the hair on the body is white and red; its manner of running is like the camel's; when it runs its two fore feet go together; it lies on its belly, and has a callous substance on the breast and joints like that animal. When it grazes it is obliged to spread its fore legs very wide, and even then feeds with great difficulty, therefore it rather chooses to feed on the leaves of trees than to graze in the fields, especially as its neck is exceedingly long, and can reach to a great height."

Gillius's description seems still better than that of Belon. "I have seen (says Gillius, chap. ix.) three camelopards at Cairo; on their heads are two horns six inches long, and in the middle of their forehead a tubercle rises to about the height of two inches, which appears like a third horn. This animal is sixteen feet high when he holds up his head. Its neck alone is seven feet, and it is twenty-two feet long from the tip of the nose to the end of the tail; its fore and hind legs are nearly of an equal height; but the thighs before are so long in comparison to those behind, that its back inclines like the roof of an house. Its whole body is sprinkled with large yellow spots which are nearly of a square form. Its feet are cloven like the ox; its upper lip hangs over the under; its tail is slender, with hair on it to the very point; it ruminates like the ox, and, like that animal, feeds upon herbage; its mane extends from the top of the head to the back. When it walks it seems as if its legs and flanks on both sides were alternately lame; and when it grazes, or drinks, it is obliged to spread its fore legs prodigiously wide."

Gesner affirms, upon the authority of Belon, that this animal sheds its horns like the deer; but I must confess that I never could find such a fact asserted in that author. He merely says, as above, that the horns of the camelopard are covered with hair; and he only speaks in one other place of that animal, namely, when treating of the axis, where he says, "The camelopard has a white skin, with broad spots sprinkled over it, which, though red, are not so deep as those of the axis." This fact, which however I have not been able to meet with in any part of Belon's work, would be of great importance to decide the nature of the giraffe, for if it sheds its horns every year it belongs to the stag kind; and, on the contrary, if its horns are permanent, it must be considered as belonging to the ox or goat species; but, without this precise knowledge, we cannot assert, as our nomenclators have done, that the giraffe is of the stag genus; and we are not a little surprised that Hasselquist, who has given a very long and dry description of this animal, has been silent as to its nature. After having methodically, that is to say, scholastically, heaped together a hundred useless and trifling characters, he does not say a single word on the substance of the horns, and leaves us ignorant whether they are solid or hollow, or whether they fall off or not. I refer to the description of Hasselquist, not for its utility, but for its singularity, and to excite travellers to make use of their own knowledge, and not to view objects through the spectacles of other men.

In the year 1764 a drawing and an account of the giraffe was sent to the Academy of Sciences, by which we are informed that this animal is not particular to Ethiopia, but is also found in the neighbourhood of the Cape of Good Hope.* The drawing was so badly executed that no use can be made of it,† but as the account contains a sort of description we have given it a place. "In an excursion from the Cape, made in 1762, we travelled about two hundred leagues up the country, and met with the *camelopardalis*, a drawing of which we have subjoined. Its body resembles that of an ox, and its head and neck those of the horse. All we met with were of a white colour, sprinkled with brown spots. They have two horns on the head, about a foot long, and their feet are hoofed. We killed two of these animals, and sent their skins to Europe, the several measurements of which were as follows: the length of the head one foot eight inches; the height, from the bottom of the fore foot to the withers, ten feet; and from the withers to the top of the head seven feet; in all seventeen feet in height. The length from the withers to the reins is five feet six inches, and from thence to the tail one foot six; the length, therefore, of the whole body is seven feet, and the height, from the hind feet to the reins, eight feet five inches. The great disproportion in the height and length of this animal seems to prevent its being of any service. It feeds on the leaves of trees, and when it wants to drink, or take any thing off the ground, it is obliged to kneel with its fore legs."

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* Vaillant also, in his travels into the interior parts of Africa, asserts, that he met with giraffes in very great numbers.

† This we have also obviated, our figure being from a drawing taken by M. Vaillant from life.

In inspecting the accounts travellers have given of the giraffe, I find they all agree that it can reach with its head to the height of sixteen or seventeen feet when standing erect, and that the fore legs are as high again as the hind ones, so that it seems as if it was seated upon its crupper. They likewise agree that it cannot run very swift, by reason of this disproportion; that it is very gentle, and that by this quality, other habits, and even by the shape of the body, it partakes more of the nature of the camel than of any other animal; that it is among the number of ruminating animals, and, like them, is deficient of the incisive teeth in its upper jaw. By the testimonies of some travellers we also find that the giraffe is to be met with in the southern parts of Africa, as well as in those of Asia.

It is very evident, from what we have mentioned, that the giraffe is a peculiar species, and totally different from every other animal. If we would refer it to any it should rather be to the camel than the stag, or the ox. It is true the giraffe has two small horns, and the camel none; but they resemble each other so much in other respects that I am not surprised at some travellers having given it the name of the *Indian camel*. Besides, we are ignorant of the substance of the horns of the giraffe, and, consequently, we know not if in that part he approaches nearer to the stag than to the ox; and, possibly, they may be of a substance different from either; they may be composed of united hairs like those of the rhinoceros, or of a substance and texture peculiar to themselves.

The reasons which have induced nomenclators to rank the giraffe with the stag kind, seem to have arisen from the pretended passage of Belon, quoted by Gesner, which indeed would be decisive if it were true. They seem also to have misunderstood what authors have said of the hair of those horns; they have imagined that the writers have said the horns of the giraffe were covered with hair, like the fresh-sprung horns of the stag, and from thence concluded they were of the same nature; but, in fact, the giraffe's horns are only surrounded with coarse hair, and not covered with a down, or velvet, like those of the stag. This circumstance tends to support the probability that the horns of the giraffe are composed of united hair, like those of the rhinoceros, and their bluntness at the extremities greatly favours this idea. If, again, we consider that the elk, rein-deer, stag, roe-buck, &c. have their horns always divided into branches or antlers, and that, on the contrary, the horns of the giraffe are only simple, and consist of one stem, we must be convinced that they are not of the same nature, unless analogy be entirely violated. The tubercle is in the middle of the head, which, according to travellers, seem to form a third horn, is another strong circumstance in favour of this opinion. The two horns which are not pointed, but blunt at the ends, are, perhaps, only tubercles somewhat longer than the former. All travellers also uniformly inform us that the female giraffes have horns like the males, but that they are smaller. If this animal were really of the stag kind, analogy would here also be violated, for of all animals of that genus there is only the female rein-deer that has horns, the reason of which we have before mentioned. On the other hand, as the giraffe cannot graze but with great difficulty on account of the excessive height of its fore legs; as it chiefly and almost solely feeds on the leaves and buds of trees, it may be presumed, that the horns, which are the most apparent superfluity of the organic particles derived from the food, would be analogous to the nature of the food, as well as the horns of the stag. Time will confirm the propriety of one or other of these conjectures. One word more in Hasselquist's description would have fixed these doubts, and clearly determined the genus of this animal. But scholars, who have only the gamut of their master in their heads, or rather in their pockets, cannot avoid making blunders and essential omissions, because they entirely renounce investigation, which should guide every observer of Nature, and view her productions through the false medium of arbitrary method, which only serves to hinder them from reflecting on the objects they meet with, and to calculate the description of them on a bad and erroneous model. As, in reality, all objects differ materially from each other, so they ought all to be treated differently; one single striking character happily discovered, is sometimes decisive, and often conveys more knowledge of a subject than a thousand trifling indexes. Whenever they are numerous they consequently become equivocal and common, and then they are at least superfluous, if not prejudicial, to the real knowledge of Nature, who sports with the forms we prescribe, soars above all method, and can only be perceived by the penetrating eye of Genius.

SUPPLEMENT.

FROM M. Allemand we received a letter, dated October, 1766, containing a number of excellent observations respecting this animal, and from which the following is an extract: "I am

"I am in possession of a stuffed giraffe, and since you expressed a desire to know the nature of its horns I cut one of them off, and send it to you; it is, however, necessary to observe, that it belonged to a very young one. I received it from the governor of the Cape, who informed me that it was killed as it was lying by the side of its mother; it was about six feet in height, and its horns did not exceed two inches and a half. These horns were covered all over with skin and hairs; the base was more than an inch broad, forming an obtuse cone; and to be certain whether it was solid or hollow I sawed it through longitudinally with that part of the skull to which it adhered; and I found its texture to resemble that of the horns of the stag more than any other animal. If indeed I were positive that a horn which was sent me as belonging to a giraffe did really belong to that animal, I should not hesitate to say there was no difference between them, except in the figure, this being straight, and without branches. With respect to the legs I conceive their disproportion in length has been greatly magnified, for the difference between the fore and hind ones of this young animal is very slight."

The horns of the giraffe being solid, and their substance similar to those of the stag, there could be no doubt of his ranking in the same genus, especially if he sheds his horns annually of which, however, we are still uncertain; but we may safely assert he ought to be separated from that of the ox, and all those animals whose horns are hollow; and, indeed, until the contrary be proved to be the fact, we cannot do otherwise than consider the giraffe as a peculiar species, in the same manner as the elephant, rhinoceros, the hippopotamus, forming a species which has no collaterals, and which seems to be a privilege conferred by Nature simply on those which are of the largest magnitude.

In the description of M. Allemand we freely acknowledge that he has displayed much accuracy, and a perfect intimacy with the subject; but yet I apprehend that the longest of the horns he did me the favour to transmit does not belong to a giraffe, for the short one is very thick, and that quite thin, comparatively with their different lengths. In an anonymous description which I received from Holland of this animal it is stated, that the horns of a full-grown giraffe are a foot long, and as thick as a man's arm; according to which the horn we are now considering being six inches long, it ought to be full twice as thick, as it is, in reality; and, indeed, it so perfectly resembles the first horns of a young stag, that we can have little doubt of its belonging to that animal.

As to the nature of the giraffe's horns I feel no hesitation in coinciding with the opinion of M. Allemand. The protuberance on the front is osseous, and may be considered as a third horn; and as the horns adhere to the cranium, they should be considered as osseous prolongations of the head. In short the horn of the giraffe appears to be a bone, differing from that of the ox by its covering, the latter being entirely surrounded with a horny substance, and the former with hair and skin.

THE LAMA AND THE PACOS.

THERE are examples in every language, of two different names being applied to the same animal, one of which has a relation to its wild state, and the other to its domestic. The wild boar and the hog are the same animal, under two names, no ways relative to any difference in their natures, but to the condition of the species; one part of which is under the power of man and the other independant. It is the same with respect to the lamas and the pacos, which were the only domestic animals of the ancient Americans: these names belonged to them in their domestic state. The wild lama was called huanacus, or guanaco; and the wild pacos, vicuna, or vigogne.* I conceived this remark necessary to avoid the confusion of names. These animals are to be found only in the New World: they seem even to belong to some particular parts, beyond the limits of which they are never to be seen. They appear confined to that chain of mountains which stretches from New Spain to Terra Magellanica: they inhabit the highest regions of the globe, and seem to require a purer and more refined air than that of our highest mountains.

It is singular, that although the lama and the pacos are domestic in Peru, Mexico, and Chili, like the horses in Europe, or the camels in Arabia, we scarcely know any thing of them; and notwithstanding the Spaniards have had possession of those vast countries for above centuries, not one of their authors have given us complete histories, nor an exact description of these animals, which they are using every day! It is pretended indeed, that they cannot be transported into Europe, nor even be brought from their heights, without, at least, risking their lives in a short time; but at Quito, Lima, and many other towns, where persons of literature reside, they might have designed, described, and dissected these animals. Herrera says but very little about them, and Garcilassa only speaks from other authors. Acosta and Gregoire de Bolivar have made the greatest collections of facts relative to the natural dispositions of lamas, and the advantages to be derived from them; but they have left us in the dark as to their interior conformation, and of the length of time they go with young; whether the lama and the pacos are two species absolutely separate from each other; whether they mix together, or whether there are any intermediate breed, and a number of other facts necessary to render their history complete.

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* The Peruvians yet call the lama by the name of *runa*, which signifies sheep. *Lama* is a generic word signifying *animal*, *brute*, and at this day they understand by the word *runa llasna*, an Indian sheep. A modern traveller observes, that the *guauaco*, and the *chillehueque* are animals quite distinct from the *lama*. It is therefore improperly that these names are found among those cited by Buffon as applied to the *lama*.

Although it is pretended these animals die if they are removed from their native country, yet it is certain that after the conquest of Peru, and for a long time after, some of them were transported into Europe. The animal spoken of by Gesner, by the name of *allocamelus*, and of which he has given a figure, is a lama, which was brought alive from Peru to Holland in 1558. It is the same with that Matthiolus mentions by the name of *elaphocamelus*, the description of which he has given with great care and accuracy. The pacos, and, perhaps, also the lamas, have been often transported into Spain, to endeavour to naturalize them. We ought, therefore, to be better informed of the nature of these animals, which might prove very useful to us; for, probably, they would thrive as well upon the Pyrenean and Alpine mountains as on the Cordeliers.

Peru, according to Gregoire de Bolivar, is the native country of the lamas: they have indeed been conducted into other provinces, as New Spain, &c. but this is rather from curiosity than utility. But in Peru, from Potosi to Caracas, these animals are in great numbers; they constitute the chief riches of the Indians, and add not a little to the wealth of the Spaniards, who rear them. Their flesh is excellent food; their wool may be spun into beautiful cloathing; and they are capable of carrying heavy loads in the most rugged and dangerous ways. The strongest of them will travel with from one hundred and fifty, to two hundred and fifty pounds weight on their backs; their pace is but slow, and their journey is seldom above fifteen miles a day; but, then, they are sure-footed, descend precipices, and travel safely among the most craggy rocks, where even men can scarce accompany them. They commonly travel for five days together, and then they are obliged to rest, which they do of their own accord for two or three days before they resume their journey. They are much employed in carrying the riches dug out of the mines of Potosi. Bolivar affirms, that in his time about three hundred thousand of these animals were thus kept in actual employ.

The growth of the lama is very quick, and its life is but of short duration. This animal couples at three years of age, and remains strong and vigorous till twelve, after which it begins to decline, and becomes entirely useless at fifteen.* Their nature appears to be modelled on that of the Americans; they are gentle and phlegmatic, and do every thing with the greatest leisure and caution. When they stop on their journeys to rest, they bend their knees very cautiously, in order to lower their bodies without disordering their load; and as soon as they hear their driver whistle, they rise up again with the same precaution, and proceed on their journey. They feed as they go along, whenever they can find grass; but they never eat in the night, even though they have fasted all day; they employ that time to ruminate. When they sleep or ruminate, they rest with their feet folded under their bellies. When overloaded, or fatigued, they sink down, and will not rise again though the driver strikes him with his utmost force. His last resource to urge them forward by means of anguish, is to compress their testicles; this often is of no effect, and if the driver continues his torments the animal grows desperate, and kills himself by violently beating his head against the earth: they do not make any defence either with their feet or teeth, and it may be said, they have no other arms than those of indignation. When persecuted they spit in the face of those who oppress them; and the Indians say, that this saliva is of such an acrimonious nature, as to cause very dangerous eruptions on the skin.

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* At Chili, according to Molina, they consider thirty years as the ordinary term of the life of a lama; and it is certain that these animals begin to propagate at the age of three years.

The lama is about four feet high; its body, comprehending the neck and head*, is five or six feet long. The head is small and well proportioned; the eyes large, the nose somewhat long, the lips thick, the upper one being divided, and the under a little pendulous. He has neither incisive nor canine teeth in the upper jaw. His ears are four inches long, which he moves with great agility. His tail is seldom above eight inches long; small, straight, and a little turned up at the end. He is cloven footed, like the ox, but he has a kind of spur behind, which assists the animal to support himself over precipices and rugged ways. His back, crupper, and tail, are cloathed with a short wool, but it is very long on the belly and sides. These animals differ in colour; some are white, others black, but most of them a mixed brown. The dung of the lamas is like that of the goat. The genital members in the male are slender and turned back, so that it passes its water backwards; they are much inclined to venery, although they copulate with difficulty. The female has a very small aperture; she postrates herself to receive the male, whom she invites with her sighs; but a whole day is sometimes passed before they can accomplish their purpose; and all this time is spent in growling, quarrelling, and spitting at each other; and as these long preludes fatigue them, the Indians assist them to commence the operation. They seldom produce more than one at a time. The mother has but two teats, and the young one follows her as soon as it is brought forth. The flesh of the young lamas is excellent food, but that of the old ones is dry and tough. In general, both the flesh and wool of the domestic lamas is preferable to that of the wild: their skin is firm: the Indians make their shoes of it, and the Spaniards use it for harness. These useful, and even necessary, animals in the countries they inhabit, are attended with no expence to their masters; as they are cloven-footed they do not require to be shod, and their wool renders saddles unnecessary. Satisfied with a small portion of vegetables and grass they want neither corn nor hay; and they are still more moderate in what they drink, as their mouths are continually moistened with saliva, which they have in greater quantity than any other animal.

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* Their necks are as long as those of the camel, to which animal they have a great resemblance, excepting the bunch on the back.

The huanacus, or wild lamas, are stronger, brisker, and swifter, than the domestic ones; they run like a stag, and climb over the most craggy precipices like the goat: their wool is shorter, and their colour tawny. These animals, even when in a state of freedom, assemble in herds, sometimes to the number of two or three hundred. When they see any of the human species, they regard him at first with astonishment, without marking any fear or surprise; but shortly, as if by common consent, they blow through their nostrils, neigh somewhat like horses, and then by a general flight, take refuge on the tops of the mountains. They are fonder of the north than the south side of the hills. They climb, and often remain above the snowy tracts of the mountains; and when travelling on the ice covered with hoar-frost, they seem in the best condition, and appear vigorous in proportion to the coldness of their situation. The natives hunt the wild lama for the sake of its fleece: the dogs have much trouble to follow them; and if they once gain the rocks, both hunters and dogs are obliged to desist from the pursuit. They are very numerous all along the chain of the Cordeliers which are full 3000 fathoms above the level of the sea at Peru, and preserve that elevation from Chili, to the straits of Magellan; but on the coast of New Spain, where the mountains sink in height, none of these animals are to be found.

The pacos are a subordinate kind to the lamas, much in the same proportion as the ass is to the horse: they are smaller, and not so serviceable, but their fleeces are more useful. Their wool is fine and long, and it constitutes a sort of merchandise, as dear and valuable as silk. When in a domestic state they are called *alpaques;* they are then sometimes black, or brown mixed with yellow, but the natural colour of the pacos is that of a dried rose-leaf, which is so fixed, that it undergoes no alteration under the hands of the manufacturer. They not only make good gloves and stockings of this wool, but also form it into quilts and carpets, which sell at a very high price, and form a valuable part of the Spanish commerce.

The pacos possesses many things in common with the lamas; they belong to the same country, are of the same dispositions, manners, and nearly the same temperament; they also resemble the lamas in their figure; being however smaller, their legs shorter, and their muzzles thicker and closer: they have no horns; they inhabit and pasture on the highest parts of the mountains. Snow and ice seem rather to refresh than to disagree with them: they keep together in flocks, and run very swift; they are very timid, and as soon as they perceive any person they take flight, driving their young before them. The ancient monarchs of Peru rigorously prohibited the hunting of them, because they multiply so slowly; and since the arrival of the Spaniards in those parts their number is greatly decreased. The flesh of these animals is not so good as that of the huanacus, and they are only sought after for their fleece, and the bezoars they produce. The method of taking them, proves their extreme timidity, or rather their weakness. The hunters drive a flock of them into a narrow passage, across which they have stretched cords about four feet from the ground, with a number of pieces of linen or woollen cloth hanging to them. The animals are so intimidated at these rags, agitated by the wind, that they stop, and crowding together in a heap, great numbers of them are killed with the greatest ease. But if there happen to be any hunacus among the flock, as they are less timid than the pacos, they leap over the cords; the example is immediately followed by the whole group, and then they escape from their pursuers.

In respect to the domestic pacos, they are employed to carry burdens, like the lamas; but they carry a much less weight even in proportion to their size. They are likewise of a more stubborn nature, and when once they lie down with their load, they will suffer themselves to be cut to pieces sooner than rise. The Indians never make use of the milk of these animals, because they have scarcely enough to supply their own young. The great profit derived from their wool, induced the Spaniards to endeavour to naturalize them in Europe: they transported numbers of them into Spain, but the climate was so inimical to their nature that they every one perished: nevertheless, I am persuaded, as I have already observed, that these animals, more valuable than the lamas, might live and procreate upon our mountains, especially upon the Pyrennees. Those who brought them into Spain, did not consider that they cannot exist even in Peru, but in the cold regions, that is on the tops of the highest mountains; that they are never to be found in the valleys, and die if brought into warm countries. That on the contrary, they are still very numerous in the neighbourhood of the Straits of Magellan, where the cold is much greater than in the south of Europe; and that, consequently, in order to preserve them, they should be landed, not in Spain, but in Scotland, or even in Norway; or probably with greater certainty at the foot of the Pyrenean, Alpine, or other mountains, where they might climb to the region that most agrees with their nature. I have dwelt the more on this subject, because I imagine these animals would prove an excellent acquisition to Europe, and would produce more real advantage than all the metals of the New World, which only load us with a useless weight; for before the discovery of those mines, a pennyweight of gold or silver was of as much value as an ounce is at this present time.

Animals which feed upon vegetables, and live on the high mountains of Asia and Africa, produce the oriental bezoar, the virtues of which are so highly extolled. The animals of the mountains of Europe, where the qualities of the plants are more temperate, only produce the *ægagropili;* and in South America those animals which dwell upon the mountains of the torrid zone, afford another kind of bezoar, called *occidental*, more solid, and perhaps possessing greater virtues than the *oriental*. The wild pacos produces it in great quantities, as do the huanacus; and it is also extracted from the stags or roe-bucks of New Spain. The lamas and the pacos afford the best bezoar when in their natural or wild state: those produced in their state of slavery are small, black, and of but little or no virtue. The best bezoars are those of a dark green colour, which commonly proceed from the wild pacos, especially those which feed in the snow on the tops of the mountains. Of these, both the male and female produce bezoars; and these Peruvian bezoars are the next in rank to the oriental, and are much more esteemed than those of New Spain, which are produced by stags, and are the least efficacious of any.

THE UNAU, OR FOUR-TOED, AND THE AÏ, OR THREE-TOED, SLOTHS.

THESE two animals have had the name of *Sloths* given to them on account of their slowness, and the difficulty with which they walk. Though they resemble each other in many respects, nevertheless they differ externally and internally by such strong characters that it is impossible to mistake the one for the other, or doubt of their being very distinct species. The unau (*fig.* 166) has no tail, and only two claws on the fore feet. The aï has a short tail, and three claws on each foot. The nose of the unau is likewise longer, the forehead higher, and the ears larger than the aï. They differ also in the hair. Some parts of their viscera are formed and situated different; but the most distinct and singular character is, the unau has forty-six ribs, and the aï but twenty-eight; this alone proves them to be two species quite distinct from each other. These forty-six ribs in an animal whose body is so short is a kind of excess, or error, in nature; for even in the largest animals, and those whose bodies are relatively longer than they are thick, not one of them is found to have so many; the elephant has only forty, the horse thirty-six, the badger thirty, the dog twenty-six, the human species twenty-four, &c. This difference in the construction of the sloths supposes a greater dissimilitude between these two species than there is between the cat and dog, both of which have the same number of ribs. External differences are nothing in comparison with internal ones. The internal frame of living animals is the groundwork of Nature's design, it is the constituent form, and the cause of all figure; and the external parts are only the surface or drapery. In our comparative examination of animals, how many have we seen who often differed very much in their outward appearance and yet were perfectly alike internally; and, on the contrary, the least internal distinction has produced great external differences, and even changed the natural habits, faculties, and attributes of the animal? How many also are there armed, cloathed, and even ornamented with superfluous parts, which, nevertheless, in their internal organization entirely resemble others who are deficient in these excrescences? but we shall not here dwell on this subject, which supposes, not only a reflected comparison, but also an exposition of all the parts of organization; we shall only observe, that in proportion as Nature is lively, active, and exalted in the ape species, she is slow, constrained, and cramped in the sloths. These animals have neither incisive nor canine teeth; their eyes are dull, and almost concealed with hair; their mouths are wide, and their lips thick and heavy; their fur is coarse, and looks like dried grass; their thighs seem almost disjointed from the haunches; their legs very short and badly shaped; they have no soles to their feet, nor toes separately moveable, but only two or three claws excessively long and crooked downwards, which move together, and are only useful to the animal in climbing. Slowness, stupidity, and even habitual pain, result from its uncouth conformation. They have no arms either to attack or defend themselves; nor are they furnished with any means of security, as they can neither scratch up the earth nor seek for safety by flight, but confined to a small spot of ground, or to the tree under which they are brought forth, they remain prisoners in the midst of an extended space, unable to move more than three feet in an hour; they climb with difficulty and pain; and their plaintive and interrupted cry they dare only utter by night. All these circumstances announce their wretchedness, and call to our mind those imperfect sketches of Nature, which, having scarcely the power to exist, only remained a short time in the world, and then were effaced from the list of beings. In fact, if it were not a desart country where the sloths exist, but had been long inhabited by man and powerful animals, they would not have descended to our time; the whole species would have been destroyed, as at some future period will certainly be the case. We have already observed, that it seems as if all that *could* be, *does* exist; and of this the sloths appear to be a striking proof. They constitute the last term of existence in the order of animals endowed with flesh and blood. One more defect and they could not have existed. To look on these unfinished creatures as equally perfect beings with others; to admit final causes for such disparities, and from thence to determine Nature to be as brilliant in these as in her most beautiful animals, is only looking at her through a straight tube, and making its confines the final limit of our judgment.

Why should not some animals be created for wretchedness, since in the human species the greatest number are devoted to pain and misery from their birth? Certainly, evil is more our own production than that of Nature. For one man who is unhappy from being born weak and deformed, thousands are rendered so by the oppression and cruelty of their fellow-creatures. Animals are, in general, more happy, because each species has nothing to dread from their individuals; to them there is but one source of evil, but to the human species there are two. Moral evil, which he has produced himself, is a torrent which is increased into a sea, whose inundation covers and afflicts the whole face of the earth. Physical evil, on the contrary, is confined to very narrow limits; it seldom appears alone or unaccompanied with an equal if not a superior good. Can animals be denied happiness when they enjoy freedom, and have the faculty of easily procuring subsistence, when they are less subject to ill health, and possess the necessary or relative organs of pleasure in a more eminent degree than the human species? In these respects animals in general are very richly endowed; and the degraded species of the sloths are, perhaps, the only creatures to whom Nature has been unkind, and the only ones which present us the image of innate misery and wretchedness.

Let us now inspect their condition more closely; being unfurnished with teeth they cannot seize upon prey, nor feed upon flesh or vegetables: reduced to live on leaves and wild fruits, they consume much time in crawling to a tree, and still more in climbing up to the branches; and during this slow and painful labour, which sometimes lasts many days, they are obliged to support the most pressing hunger. When they have accomplished their end they cling to the tree, crawl from branch to branch, and, by degrees, strip every twig of its leaves. In this situation they remain several weeks without any liquid; and when they have consumed the store, and the tree is entirely naked, they still continue, unable to descend until the pressure of hunger becomes more powerful than the fear of danger or death, and they suffer themselves to fall to the ground like an inanimate mass, without being capable of exerting any effort to break the violence of the fall.

When on the ground they are exposed to all their enemies, and as their flesh is not absolutely bad they are sought after both by men and beasts of prey. They seem to multiply but little, or if they produce often it is only a small number at a time, as they are furnished with but two teats: every thing, therefore, concurs to their destruction, and the species supports itself with great difficulty. Although they are slow, heavy, and almost incapable of motion, yet they are hardy, strong, and tenacious of life; they can exist a long time deprived of all food; they are covered with a thick, coarse fur, and being unable to take much exercise they waste little by perspiration, and therefore they fatten by rest, however poor their food. Though they have neither horns nor hoofs, nor incisive teeth in the lower jaw, they belong, notwithstanding, to the number of ruminating animals, and have four stomachs, so that they may compensate for the quality of their food by the quantity they take at a time; and what is still more singular, instead of having, like other ruminating animals, very long intestines, they are very short, like those of the carnivorous kind. The ambiguity of Nature seems somewhat discovered by this contrast. The sloths are certainly ruminating animals, as they have four stomachs; but they are deficient in all the other external and internal characters which belong to all animals in that class. There is also another singularity in these animals, instead of distinct apertures for the discharge of the urine, excrements, and the purposes of generation, these animals have but one, which terminates in a common canal, as in birds.

Finally, if the misery which results from a defect of sensation be not the greatest of all, the miserable state of these animals, although very apparent, seems not to be real, for they appear to have little or no sensation, and their dull and heavy look, their indifference to blows, which they receive without being in the least affected, prove their insensibility. But what still further demonstrates this fact is, their not instantly dying upon their hearts and bowels being taken out. Piso, who made this cruel experiment, says, that the heart, after being separated from the body, beat forcibly for more than half an hour, and that the animal continued to contract its limbs in the same manner as when asleep.* From these circumstances this quadruped approaches not only the tortoise but also other reptiles who have no distinct centre of sensation: thus all these animals are miserable without being unhappy; and Nature, even in her most unfinished productions, appears always to act more as a real parent, than a step-mother.

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* Sonnini says, that wishing to kill a sloth for the purpose of preparing the skin, he exhausted every possible means to deprive it of life; but such was its principle of vitality that he could not remain any longer a witness of his own barbarous endeavours; and he quitted the room seized with horror at the idea of the evils which this miserable animal must endure, and with astonishment at that impenetrability which prolonged its existence.

Both these animals belong to the southern parts of the New Continent, and are never to be met with in the Old. We have already observed, that the editor of Seba's cabinet was deceived in calling the unau by the name of the *Ceylon sloth*. This error, which has been adopted by Klein, Linnæus, and Brisson, is now more evident than formerly. The Marquis de Montmirail has a living unau, which was brought him from Surinam: those in the royal cabinet came from the same place, and from Guiana; and I am persuaded, that both species exist in the desarts of America, from Brasil to Mexico; but as it never inhabited the northern countries, it could not have passed from one continent to the other; and if these animals have been seen either in the East Indies, or on the coast of Africa, it is certain, that they must have been transported thither. They can endure neither cold nor rain; the change from wet to dry spoils their fur, which then resembles bad dressed hemp, rather than wool or hair.

I cannot conclude this article better than by inserting the observations which the Marquis de Montmirail communicated to me concerning the unau, which had been above three years in his menagerie. "The fur of the unau is much softer than that of the aï. It is probable that what travellers have said of the excessive slowness of the sloths, only belongs to the aï. The unau, although very heavy, and of an excessively aukward motion, ascends and descends the highest tree many times in a day: he is most active in the evening and during the night, which makes it probable that he sees but badly in the day, and that his eyes are of no use to him but in the dark. When I bought this animal at Amsterdam, it was fed with sea-biscuit, and I was told, that when the winter was over, and the verdure began to appear, it would require nothing but leaves. We supplied him with leaves which he eat freely while they were green and tender; but the moment they began to be dry, shrivelled, or worm-eaten, he refused them. During the three years that I preserved him in my menagerie, his common food was bread, apples, and roots; and his drink always milk. He always took his food in one of his fore-claws, but with difficulty, and which was increased in proportion to the size. His cry, though plaintive and melancholy, does not resemble that of the aï; it is short, and seldom uttered. The most natural situation of the unau, and which he prefers to all others, is suspending himself on a branch of a tree, with his body downwards. He sometimes even sleeps in this position, his four claws fastened on the same point, and his body describing the figure of a bow. The strength of his muscles is incredible; but it becomes useless to him when he walks, for his motion then is not the less constrained or tottering. This formation alone seems to be the cause of the slowness of this animal, who besides has no violent sensation, and does not recognize the hand that feeds him.

SUPPLEMENT.

WE have been informed by M de la Borde, that in Cayenne there are two species of sloths, whose principal differences consist in the length of their bodies, the one, which is called the *sheep sloth*, being nearly twice as long as the other, known by the name of the *bashful sloth*. The first has bushy hair of a dirty white; he weighs about twenty-five pounds; he climbs to the tops of trees, from whence he throws himself down in a very aukward manner. The latter does not weigh more than twelve pounds; he has some black spots on different parts of his body, and his hair is not so rough as the other. Both species produce but one young at a time, and which they carry with them on their backs; and there is some reason to believe the female brings forth on the trees; the leaves of which form the general food of both species, and which are equally common. They frequently suspend themselves by their claws from the branches of the trees, and when so situated they may be taken at pleasure, as they will suffer the branch to be cut asunder without letting go their hold. They ascend the trees by sticking in their fore claws alternately, and so drag up their bodies, but the slowness of their motion, is almost incredible. When kept in the house, they climb up the sides of a door or post, and never rest upon the ground; and if a stick is put to them, they will climb to the top and cling to it with their whole body.

It is plain from the above description, that the sheep sloth is the same as that we have spoken of under the name of the unau, and that this bashful sloth of our aï.

M. Vosmaër has denied the assertion in my history of these animals, that they are unable to descend from a tree, but allow themselves to drop down like inanimate blocks; I had the fact from eye-witnesses, and it is now supported by the testimony of M. de la Borde.* With respect to my other assertion, that the sloths have no teeth, I readily admit my mistake and feel myself indebted to M. Vosmaër for correcting the error.

THE SURIKAT.

THIS animal was purchased in Holland by the name of the *Surikat*. It is a native of Surinam, and other provinces of South America. We kept one for some time; and afterwards delivered it to M. de Sevé, who has so carefully drawn the animals in this Work: during the time that gentleman kept him alive, he made some remarks of his natural habits, which he communicated to me. This animal is very handsome, lively, and subtle; he sometimes walks on his hind legs, and often sits upright on them, with his fore paws hanging down, his head erect, and moving on the neck as on a pivot. He always assumed that posture when he came near the fire for warmth. He is not so big as a rabbit, and nearly resembles the ichneumon in size and hair; his tail is somewhat shorter. His snout is prominent and raised; and by which character he is more like the coati than any other animal. He has also a character peculiar to him and the hyæna; as these two are the only animals who have four toes to every foot.

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* Ulloa also in his voyage to Peru, says, that the unau climbs up the tree which is the most laden with fruit; and that when he has done, he rolls himself up into a round ball, and lets himself fall plump down, to avoid the trouble of descending.

At first we fed this animal with milk, as he was very young; but his inclination for flesh soon shewed itself. He ate raw meat with eagerness, and was particularly fond of poultry. He also endeavoured to seize young animals. A small rabbit would have fallen a prey to him if he had not escaped. He was very fond of fish, and still more of eggs. He would take out eggs that were put in water to be boiled, and carry them off with his paws. He would eat neither fruit nor bread. He used his fore-feet, like a squirrel, to carry food to his mouth. He lapped his drink like a dog, but would not touch water unless it was luke-warm. His common drink was his own urine, although of a very strong smell. He played with ca's with the greatest familiarity. He did no injury to children, and never bit any person in the house but its master, against whom he had taken an aversion. He never gnawed with his teeth, but often scratched plaister and furniture with his nails. He was so well tamed, that he answered to his name, when called, and went loose about the house. He had two kind of voices, one like the barking of a young dog, when it was left long alone, or heard an unusual noise; and when caressed, or desirous of expressing pleasure, he made a noise as strong as that of a rattle briskly turned. This was a female animal, and only lived one winter, notwithstanding all the care that was taken to feed and keep her warm.

SUPPLEMENT.

BESIDES the master of the house, which we formerly observed, we have since been informed that the Surikat bit a number of other persons and to which it seemed induced by some particular smell; for when laid hold of, it always curled up its nose to smell the person, and an observation was made that it never failed to bite those whom it had bit before, however often they came near it, and this experiment was made by several people; to some persons it seemed to have such an aversion that it would use various stratagems to get at them, and if it could not bite their legs, it would lay hold of their shoes or petticoats.

M. Vosmaër says, in his work, "it is probable M. de Buffon was deceived both in respect to the name and native country of the Surikat, which was last summer sent by M. Tulbagh to the Prince of Orange; for it belongs to Africa and not to America. This small animal is not mentioned by Kolbe, and possibly was not known to him, for with a male and female transmitted to me I received the following note from the governor: *I send by the captain two small animals, a male and female of which I neither know their names nor the species to which they belong; they were brought from the remote desarts and stony mountains of this country, and were the first we had seen. They are very gentle and feed upon fresh meat either dressed or raw, eggs and ants.*

I certainly do not mean to contend against the evidence of M. Tulbagh, or deny the justness of M. de Vosmaër's remark, for I had no other authority for the name and country of this animal, although I kept him a considerable time alive, than that of the man from whom I bought it, who said he purchased it in Holland by the name of Surikat, and that it came from Surinam. But we are now certain it does not belong to South America, but to the mountains of Africa above the Cape of Good Hope; as to its name we are still uninformed, but which can easily be changed whenever that in its native country can be procured.

THE TARSIER.

WE saw this animal (*fig*. 167) by chance and in the possession of a person who could neither inform us whence it came, nor how it was called. It is remarkable for the excessive length of its hind legs. The bones of the feet, and especially those which compose the upper part of the *tarsus* are of an extraordinary length, and it is from this distinctive character we have taken its name. The tarsier, however, is not the only animal whose hind feet are thus formed; the tarsus of the jerboa is still longer, therefore the name of *tarsia*, which we have given to it must only be considered as a precarious appellation, which ought to be laid aside when the name it bears in its native country is known. The jerboa is found in Egypt, Barbary and the East Indies. At first I imagined the tarsier might belong to the same countries from its resemblance to that animal; they are both of the same size, which is not bigger than that of a middling rat; both have prodigious long tails furnished at their ends with long hairs; both have their hind legs excessively long, and those before extremely short; both have large eyes, and large erect ears; both have the lower part of their hind legs without any hair, while all the rest of their body is covered with it. These animals having thus in common such singular characters, there seemed to be a probability of their being similar species, or at least two species produced in the same climate: nevertheless, in comparing them together, in other respects, it becomes not only doubtful, but almost certain that it is no such thing. The tarsier has five toes to every foot; and may be said to have four hands, for the toes are very long and sufficiently divided; the largest of those behind, or the thumb, is terminated by a flat nail; and although the nails of the other toes are pointed, they are so short and so small, that they do not prevent the animal from using its four feet like hands. The jerboa, on the contrary, has only four toes and four long and crooked claws on its fore feet, and instead of a thumb, it has only a tubercle without a nail. But what removes it further from our tarsier, it has only three toes or three great claws on the hind feet. This difference is too great for animals whose species approach each other; and it is not impossible but they belong to distant climates; for the tarsier, by its small size, four hands, long toes, little claws, and its long tail and feet, seems to have a much greater affinity with the Mexican and other opossums. But we mean only to mention our doubts, and should be greatly obliged to those who can indicate to us the real climate and name of this little animal,* rare and singular.

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* Sonnini observes, that this rare and singular animal is found in the most distant islands of the Indian Ocean, and more particularly at Amboyna, where it is called the *podie* in the language of Madagascar. This is the only additional fact that has been acquired respecting the tarsier, since the time of Buffon.

THE PHALANGER.

TWO animals, a male and female, which were sent to us by the name of *Surinam rats*, but which have much less affinity to rats, than with those animals with which we have given the history under the names of the *marmose* and *cayopollin*. We have, therefore, rejected the denomination of Surinam rats, as complex and misapplied. As it has never been mentioned by any naturalist or traveller, we have called it *phalanger*, (*fig.* 168.) from its *phalanges* being singularly formed, and because the two first toes on the fore-feet are joined to each other to the end of the last phalanx, and are separated only near the claws; the thumb is separated from the other toes and has no claws; this last character, although remarkable, is not peculiar, for the Virginia and murine opossums have the same, but none of them have the *phalanges* fastened together.

These

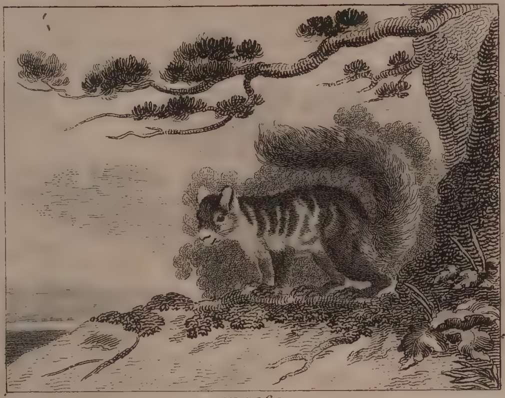

FIG.169

Coquallin

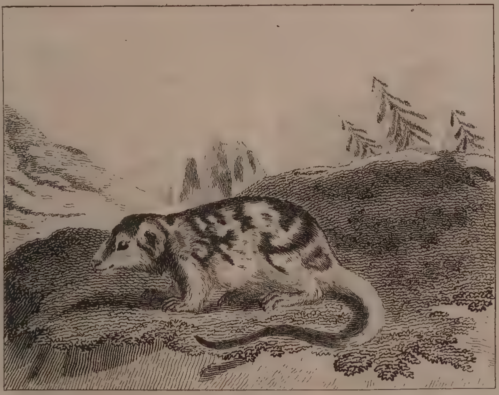

FIG.168

Phalanger

These animals vary in the colour* of the hair, they are about the size of a small rabbit, or a very large rat, and are remarkable for the excessive length of their tail, snout, and the form of their teeth, which alone is sufficient to distinguish them from the opossums, the rats, and every other species of animals with which it may be supposed to relate.

THE COQUALLIN.

I DISCOVERED this animal, which was sent me from America, under the name of the *orange-coloured squirrel*, to be the same as that which Fernandes calls *quauhicollotquapachli cozticotequallin:* but as these Mexican words are very difficult to pronounce, I have abridged the last to *coquallin* (*fig.* 169.). It is not a squirrel, although it greatly resembles that animal both in the figure and bushiness of the tail, for it not only differs by many external characters, but also by its disposition and manners.

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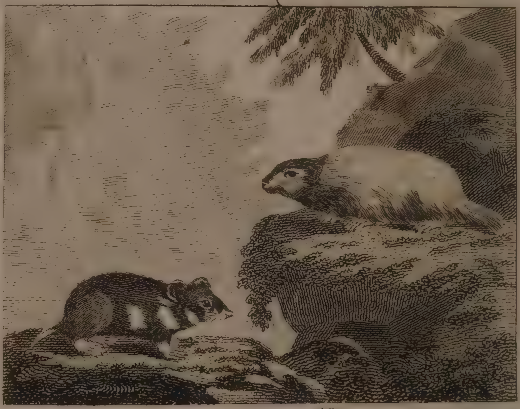
* The hair on the upper part of the body is reddish mixed with light ash colour and yellow. The hind part of the head and middle of the back, are marked with a black line. The throat, belly, legs, and part of the tail, are of a dirty yellowish white. *Pennant's Synopsis.*

The coquallin is much larger than the squirrel; *in duplam fere crescit magnitudinem*, says Fernandes. It is a pretty animal, and very remarkable for its colours; its belly is of a fine yellow, and its head as well as body variegated with white, black, brown and orange. It covers its back with its tail like the squirrel; but has not, like that animal, small brushes of hair at the tips of the ears: he never climbs up trees, but dwells in holes under the roots of trees, like the ground squirrel, where it brings forth its young; it likewise stores up corn and fruit to feed on during winter; it is a jealous and cunning animal, and so wild that it is impossible to be tamed.

The coquallin is only found in the southern parts of America. The white and orange-coloured squirrels of the East Indies are much smaller, and their colours are uniform. Those are true squirrels which dwell and produce their young on trees; but the coquallin, and the American ground squirrel, burrow under ground like rabbits, and have no other affinity to squirrels than their resemblance in form.

Engraved for Barr's Buffon



170 FIG. 171

Hamster *Bobak*

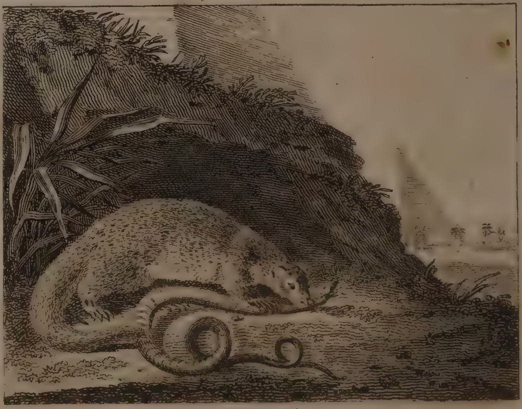


FIG. 172

Ichneumon

THE HAMSTER.

THE Hamster (*fig.* 170.) is the most famous and the most destructive rat that exists. The reason why we did not give its history among the other rats was because, at that time we had not been able to procure one of them; and we are now indebted for the knowledge we have acquired of it to the Marquis de Montmirail and M. de Waitz, who has sent us two living hamsters with an instructive memoir on their manners and natural habits. We fed one of these animals for many months, for the purpose of examining it with attention, and afterwards dissected it, in order to compare its internal structure with that of other rats, and observed, that in its interior parts it resembled more the water rat than any other animal; it resembled him also by the smallness of its eyes and the fineness of its hair; but its tail, instead of being long, is much shorter than that of the short-tailed field mouse, which, as we have already observed, greatly resembles the water-rat in its internal conformation. All these animals live under the earth, and seem to be animated with the same instinct. They have nearly the same habits, and particularly that of collecting corn, &c. and making great magazines in their holes: we shall, therefore, dwell much less on the resemblances of shape and dispositions, than upon differences which distinguished the hamster from all the other rats and mice, and field-mice, we have already spoken of.

Agricola is the first author who has given precise and particular indications of this animal. Fabricius added several facts, but Schwenckfeld has done more than all the rest; he dissected the hamster, and gave a description of it, which agrees almost entirely with ours; notwithstanding which he has not been quoted by naturalists of a more modern date, who have been contented with copying Gesner; and yet it is but justice to that author to remark, his observations are so full and correct, that by subjoining those of M. de Waitz we have whatever can be wished for on the subject of this animal.

"The habitations of the hamsters are of different constructions, according to the sex and age, and also according to the quality of the land. That of the male has an oblique passage, at the entrance of which is a quantity of earth thrown up. At a distance from the entrance there is a hole which descends perpendicularly into the chambers, or cavities of the habitation. There is no hillock of earth near this hole, which makes it probable that the oblique entrance is made hollow from the outside, and that the perpendicular hole is worked withinside from the bottom to the top.

“ The habitation of the female has also an oblique passage, with two, three, and even eight perpendicular holes, by which the young ones may come in and go out. The male and female have each a separate abode, and the female's is deeper than that of the male.

“ Both male and female burrow in the earth, at one or two feet distance from the perpendicular holes; and according to their age, and in proportion as they multiply, they form one, two, or three particular cavities, in form of vaults, as well above as below, and which are more or less spacious, according to the quantity of their provisions.

“ The perpendicular hole is the common passage by which they go in and out, and by the oblique one they throw out the earth which they scratch up. This passage also has a gentle declivity into some of the cavities, and a more steep one in others, which serves for a free a free circulation of air in their subterraneous habitations. The cavity where the female brings forth her young contains no provision, but is only a nest formed of straw and herbs. The depth of the cavities is very different. The young hamster in his first year makes its burrow only a foot deep, while the old animals often dig to the depth of four or five feet: all the cavities communicate together in one habitation, and which is sometimes from eight to ten feet diameter.

" These animals store their magazines with dry clover, corn in the ear, and beans and peas in their pods; having separated they carry out the husks and pods by the oblique passage. They commonly begin to get in their winter store about the end of August, and which they convey to their habitations in a pouch they have in their cheeks.

" When the hamster has filled his magazines he covers them over, and carefully shuts all the avenues to them with earth: this precaution renders the discovery of these animals very difficult, and the heaps of earth which they throw up before the oblique passage are the only marks to trace their habitations. The most usual method of taking them is by digging them out of their holes, which is attended with much trouble, on account of the depth and extent of their burrows. However, a man versed in this business commonly effects his purpose with good success and profit, for in autumn he seldom fails of finding two bushels of good corn in each habitation, and the fur of these animals is valuable. The hamsters bring forth two or three times in a year, and seldom less than five or six. Some years there are great numbers of them to be seen, and in others scarcely any to be met with. They multiply considerably when the seasons are wet, which causes a great scarcity of grain by the immense devastations they make.

"The hamster begins to burrow at the age of six weeks or two months; but they never copulate in the first year.

"The pole-cat is a great enemy to the hamsters, which he destroys in great numbers, and even takes possession of their holes.

"The back of the hamster is commonly brown, and the belly white; there are some, however, of a grey colour, and this difference may proceed from their age; besides these, others are met with entirely black."

The hamsters destroy each other like field-mice; two of them being put into the same cage, the female killed the male in the night, and having divided the muscles that held the jaws together, she devoured great part of his viscera. There are great numbers produced in one year, and are so destructive that in some parts of Germany a reward is fixed on their heads. They are indeed so numerous there that their fur is an important article of commerce.

All these circumstances, which we have extracted from the Memoir of M. de Waitz, and the observations of M. de Montmirail, appear to be true, and agree with what we have learnt from other quarters on this subject; but it is not so certain, as mentioned in the same Memoir, that these animals are dormant the whole winter, and recover in spring. The hamster, which we kept during the winter of 1762-3, in a chamber without any fire, and where the cold was intense enough to freeze water, did not become torpid, but moved about, and ate as usual; while the dormice which we had alive were benumbed with a much less degree of cold. Therefore the hamster has not any affinity with the marmot or dormice in this respect; and it is very improperly denominated the *Strasburgh marmot* by some of our naturalists, since it does not sleep like the marmot, and is not to be found in the vicinity of Strasburgh.

SUPPLEMENT.

IN an extract from a German publication of M. Sulzer, which appeared in the Gazette de Littérature of the 13th of September, 1774, we find many additional observations respecting the hamster. As a proof of its multiplicity in Germany an instance is given, that in one year was taken to the town-house at Gotha, 11,574 skins, in another 54,429, and in a third 80,139. It is also there stated, that the male is a courageous animal, and will defend himself against the attacks of either dogs, cats, or men; that he is naturally of a morose disposition, agrees not with his own species, and will even at times destroy his own family; he devours mice, birds, or any animal that he can overcome, and he drinks very little. In the winter they retire into their holes, where the female remains much longer than the males; she goes four weeks with young, and generally has six at a litter. When in a torpid state they do not appear to respire, or to have the smallest degree of feeling. On opening the chest, however, the heart is perceived to beat at the rate of fifteen times in a minute, whereas, when in full spirits, and somewhat irritated, it has been known to beat 180 times in the same space; when in this state, which he is never reduced to in the open air, an electric shock will not rouse him.

From the fact which we formerly stated, namely, that the hamster which we kept confined in a cage, and in a room where water was frozen, was not reduced to a torpid state, we cannot but regret that M. Sulzer has not stated the degree of cold, or want of air, which rendered them so. M. Allemand has confirmed this fact in the observations he has added to the hamster in the Dutch edition of my work. Among other remarks, he says, this animal is of the mouse kind, and sleeps during winter, like the marmot; he is of a forbidding external appearance, and his manners are not less disgusting; for he has not a single social quality; he destroys and devours every animal he can conquer, not excepting his own species; and even the females, to whom he is led by instinct, would suffer no better fate, after the gratification of his passions, which are of short duration, if she did not contrive her escape, or secure her own life by the killing of him first.

These animals pass the winter in a torpid state, and are the only ones of Europe which have pouches in their cheeks. They avoid extremes, and are not to be found either in very warm or very cold countries. As he feeds upon grain, and dwells under the earth, it is necessary for the construction of his habitation that the soil should neither be hard, sandy, nor marshy, but one that is easily penetrated, and yet so firm as not to crumble down; and it is for this reason that the hamsters are more numerous in Thuringia than in any other place, where also they have the equally great advantage of procuring all kinds of grain with ease, it being an abundant article in that country.

The hamsters come in season about the end of April, when the males seek out the females, who always have separate habitations, but do not remain with them above a few days. If two males meet in the same hole they instantly attack each other, and never give over until one has laid the other dead at his feet. The victor of course takes possession of the female, and during their amours they lay aside that ferocity with which at other times they constantly persecute each other; nay, they will at this time act for their mutual defence, and if their hole happens to be opened, and the female perceives the male in danger, she will fly at their disturber, and inflict deep and painful wounds. The females bring forth two or three times every year, they seldom have less than six young, and more frequently from sixteen to eighteen; they grow very fast, for they begin to dig the earth when they are fifteen days old, and are entirely thrown off by their mother when they are three weeks old. They have little attachment to their offspring, for if their habitations are attacked the mother's only solicitude is to take care of herself; for which she penetrates deeper into the earth, and is so regardless of the cries of her young that she even blocks up the hole after her to prevent their following.

They feed on all kinds of herbs, roots, grain, and the flesh of those animals which they can subdue. As they are not calculated for going a great distance, they lay in their first store of such provisions as the fields in their immediate vicinity present, and this is the reason why one of their chambers is often found full of a single sort of grain; but as the harvest is got in they go to greater distances, carrying back with them every thing they can meet with, without distinction; and for this purpose Nature has bestowed on them a pouch in each cheek, the outsides of which are smooth and membranous, and the insides furnished with a number of glands, which supply a fluid, and keep them so flexible that they receive no injury from any kinds of grain they may wish to convey, however rough or sharp. In each of these pouches he can carry an ounce and a half of grain, and which he empties by pressing his fore-feet against his cheeks. When a hamster is met thus loaded he may be taken with the hand, because at that time he cannot bite; but if he is not laid hold of instantly he soon empties his pouches, and will defend himself. An old male will collect a great quantity of grain in this manner, and there have been instances of finding 100 pounds weight in a single hole; but the females and the young ones do not store so much.

If their holes are opened in winter, the animal is found lying upon a bed of soft straw, with his head bent between his two fore-legs under his belly, and his hind feet turned up and resting on his nose; his eyes are quite shut, and if forced open they close again immediately; in a word, he has every appearance of a dead animal, and his whole body feels as cold as ice. This torpid state of the hamster has been attributed to a certain degree of cold; but although that may be the case with bats and dormice, yet it is necessary with this animal that he should also be deprived of the impression of the air; for if he be shut up in a cage, and put in a room where water will freeze, he will not become torpid; but if that cage is buried some feet under the earth, and so covered that the air cannot penetrate to him, he will in the course of a few days become equally so as if he were in an habitation of his own framing. The cage being brought up the animal soon recovers in the air, and if put under the earth he sinks again into his torpid state; and this he will continue to do as long as there is any frost. The same circumstance takes place if they are dug out of their holes during their torpor, after being a few hours exposed to the air, they invariably awake, whether it is night or day, which proves that light is not part of the cause. In recovering from his torpid state the limbs of the hamster first begin to lose their stiffness, he then breathes, but at long intervals; by degrees opens his mouth and eyes; at length he endeavours to get upon his legs, and continues his efforts until he has accomplished that point; when after standing perfectly still for a few moments, he begins to walk and go about as usual.

This animal seems to be influenced by no other passions but rage, for he invariably makes war against all that come in his way, regardless of their superiority in size or strength. He has no idea of flight, and will suffer himself to be beat to pieces rather than yield. When he sees a dog coming towards him, he empties his cheeks, if he happens to be loaded, then swells them up to an enormous size, waits the approach of his enemy, who being sufficiently near, he rises upon his hind legs, and darts furiously upon him; and if he once makes good his hold he never quits it without the loss of life; but the dogs, who are fond of hunting them, generally avoid the first attack, and then seize them by the back. His ferocious disposition is not only exercised against other animals, but even his own species, for two hamsters never meet but they attack each other, and fight till one is slain, whom the conqueror devours; and in this respect there is no difference even if the rencounter is between a male and female.*

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* This animal is very common in all the southern parts of Russia, principally in the most fertile countries and the best cultivated. He is not even rare in Tartary and the most southern parts of Siberia. In the desarts they live a wandering life; and they choose from preference those places where there is a great quantity of liquorice, the seeds of which serve them for provision.

THE BOBAK,* AND OTHER MARMOTS.

THE name of the *Strasburg marmot* has been affixed to the hamster, and that of the *Poland marmot* to the bobak (*fig.* 171). But it is as certain, that the hamster is not a marmot, as it is probable the bobak is one; for he only differs from the marmot of the Alps by the colour of his hair, which instead of being brown is rather a pale yellow: he has also a thumb, or claw, to the fore-feet, while the marmot has only four toes and no thumb; but in every other respect they perfectly resemble, which makes us presume they do not form two distinct species. It is the same with respect to the monax, or Canadian marmot, which some travellers have termed the *whistler:* he only seems to differ from the marmot by the tail, which is longer and thicker of hair. Therefore the Canadian monax, the Poland bobak, and the Alpine marmot, appear to be all the same animal, which from the influence of different climates have undergone those alterations we have before particularized. As this species prefers the coldest and highest mountains, and inhabits Poland, Russia, and other parts of the north of Europe, no wonder it is found in Canada, where it is only somewhat less, a circumstance not particular to it alone; for all animals common to both continents are smaller in the new than in the old.

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* This is its Polish name. It is called *switscb* from the cry of the animal.

The Siberian animal, called by the Russians *jevraschka*, is a kind of marmot, still less than the Canadian monax, the head of which is round, and the snout snubbed. It has no external ears, nor can the auditory passages be seen without turning back the hair. The length of the body, including the head, is not above a foot; the tail, which is scarcely three inches long, is nearly round towards the body, then flat, and truncated towards its extremity. The body is thick, the hair yellow, mixed with grey, and blackish towards the end of the tail. The legs are short, but those before are somewhat longer than those behind. The hind feet have five toes, with five black claws, a little crooked: the fore feet have but four. When these animals are irritated, or when they are surprised, they bite violently. and make a shrill noise like the marmot. They sit upon their hind legs to feed, and carry the food to their mouths with their fore paws. They copulate in spring, and bring forth in summer; commonly five or six at a time. They dig burrows for their winter residence, and the females suckle their young at the bottom of their habitations. Though these animals bear a great resemblance to the marmots, they nevertheless seem to be a different species, for the Poland or Alpine species of marmot are found in the same parts of Siberia, which the inhabitants call *suroks*, and these two species have never been observed to mix together, nor produce an intermediate race.

THE JERBOA.

JERBOA is a generic name, which is made use of to denote those remarkable animals whose legs are extremely disproportionate; those before being not above one inch long, and those behind two inches one fourth, exactly resembling those of a bird. There are four distinct species, or varieties, in this genus; first, the *tarsier*, which we have already spoken of, and which is certainly a particular species, having five toes on each foot, like those of a monkey. Secondly, the *jerboa*, which has four toes on the fore-feet, and three on those behind. Third, the *alagtaga*, whose feet are formed like those of the jerboa, with this difference, that it has five toes on the fore.feet, and three on the hind, with a spur, that may be considered as a thumb, or fourth toe, much shorter than the others. Fourth, the *daman Israel*, or *lamb of Israel*, which has four toes to the fore feet, and five on those behind, and which may possibly be the same animal that Linnæus has described under the name of *mus longipes*.

The head of the jerboa is sloped somewhat in the manner of a rabbit; but the eyes are larger, and the ears shorter, higher, and broader in proportion to its size. Its nose is deprived of hair, and is of a flesh colour, and its muzzle short and thick, the orifice of the mouth very narrow, the upper jaw very broad, and the lower narrow and short; the teeth are like those of a rabbit; the whiskers are composed of long black and white hairs; the fore feet are very short, and never touch the ground; they are furnished with four claws, and are only used as hands to carry the food to the mouth; the hind feet have but three toes, the middle one is longest, and all of them have claws; the tail is three times longer than the body, and is covered with short stubborn hair, of the same colour as those on the back, but tufted at the end with longer and softer hair; the legs, nose, and ears, are bare, and of a flesh colour; the upper part of the head and back are covered with reddish hair, the sides, throat, and belly, are whitish; below the reins, and near the tail, there is a large black, transversal band, in the form of a crescent.

The alagtaga is smaller than a rabbit, its body is shorter, its ears are long, wide, bare, thin, transparent, and sprinkled with blood-vessels, which are very apparent; the upper jaw is much larger than the lower, but blunt and pretty wide at the extremity; the whiskers are large; the teeth are like those of the rat, the eyes full, with the iris and pupil of a brown colour. The body of this animal is narrow before, but very broad and round behind; the tail is very long, it is not so thick as the little finger of a man, and about two-thirds of it is covered with short and rough hair, which grows longer, softer, and thicker, towards the end, till at length it forms a kind of tuft, black at the beginning, and white towards the extremity. The fore-feet are very short and have five toes, the hind ones, which are very long, have only four, three of which are placed forwards, and the fourth, which is a kind of thumb, stands at about an inch distant from the rest. All these toes are furnished with claws, shorter in the hind than in the fore feet. The hair of this animal is soft, pretty long, yellow on the back, and whitish under the belly.

By comparing these two descriptions, the first of which is taken from Edwards and Hasselquist, and the second from Gmelin, we shall perceive, that these animals resemble each other as much as possible. The jerboa is only smaller than the alagtaga, and has only four toes on the fore-feet, and three on the hind ones, without any spur; while the other has five on the fore-feet, and three and a spur on those behind; but I am inclined to think this difference is not universal, for Dr. Shaw, who has given a description of the jerboa of Barbary, represents it with this spur, or fourth toe, on the hind-feet; and Mr. Edwards remarks, that he carefully examined two jerboas he saw in England, and that he saw no spur in either of them. Thus this character which would specifically distinguish the jerboa from the alagtaga, not being universal is of no consequence, and rather remarks the identity, than the diversity of the species. Neither is the difference of size any greater proof of their being two different species; possibly Edwards and Hasselquist have only described young jerboas, and M. Gmelin, an old alagtaga. There are only two things which create any doubt in my mind, viz. the difference in the size of their tails, and the variety in the climates they inhabit, for the jerboa is common in Circassia, Egypt, Barbary, and Arabia; and the alagtaga, in Tartary, along the Wolga, and as far as Siberia. It is seldom that the same kind of animal inhabits such different climates; and whenever it does happen the species undergoes great changes; which, we presume, is the case with the jerboa, of which the alagtaga, notwithstanding these differences, seems to be only a variety.

These little animals commonly conceal their hands, or fore-feet, among their hair; so that at first they appear to have only hind-feet. When they move from one place to another, they do not walk, that is advance one foot before the other, but jump or bound with the greatest ease, four or five feet at a time; they rest themselves in a kneeling posture, and only sleep in the day. In the night they seek for food, like hares, and like them, feed on grass and all kinds of grain. They are of a gentle nature, but are not to be tamed beyond a certain limit. They burrow like rabbits, and in much less time. They lay up a store of grass towards the end of summer in their habitations, and in which, in cold countries, they remain during the winter.

With respect to the daman, or lamb of Israel, which seems to be of the jerboa kind, as its fore-legs are much shorter than those behind, having never seen it, we cannot do better than copy the description of it as given by Dr. Shaw, who speaks of these two animals as of different kinds: "The daman (says this author) is also a native of Mount Lebanon, and common to be met with in Syria and Phœnicia; it is a very harmless animal, resembling the common rabbit in size, shape, and also in the disposition of the fore-teeth; but it is somewhat browner, has smaller eyes, and a head more pointed. Its fore-feet are short, and those behind long, much in the same proportion as those of the jerboa. Although it sometimes conceals itself in the earth, its common retreat is in the hollows and clefts of rocks, which is a strong reason to conclude that it is this animal and not the jerboa, which is meant in Scripture by the *Saphan*. I have not been able to learn from any one why it was called the *daman* of Israel, which signifies the *lamb* of Israel." Prosper Alpinus, who mentioned this animal before Dr. Shaw, says, that its flesh is delicate food, and that it is much bigger than the European rabbit; but this last circumstance seems doubtful, for Dr. Shaw has omitted this passage of Prosper Alpinus, whom, in other respects, he has fully quoted.

THE ICHNEUMON.

THIS animal in Egypt is called *mangutia*, but we shall adopt the name *ichneumon* (*fig.* 172.) given it by Aristotle, and others. It is as domestic in Egypt as the cat is in Europe; and is alike serviceable to destroy rats and mice. But its inclination for prey is much stronger and more violent, for it hunts and eats with the same avidity, birds, quadrupeds, serpents, lizards, and insects. It attacks every living creature, and feeds entirely on animal flesh; its courage is equal to the sharpness of its appetite, being neither intimidated by the anger of the dog, nor the malice of the cat; it even dreads not the bite of the serpent, but pursues, seizes, and kills them, however venomous. As soon as it begins to feel the effects of their venom, it immediately goes in search of antidotes, and particularly of a root which the Indians call by its name, and which, they say, is a most sure and powerful remedy against the bite of the viper or asp. It sucks the eggs of the crocodile, as well as those of fowls and birds; it also kills and eats the young crocodiles, though they are very strong even when scarcely come out of the shell; and as fable commonly precedes truth, it has been alleged that, in consequence of this antipathy, the ichneumon enters the body of the crocodile when he is asleep, and never quits him till it has devoured his entrails.

Naturalists have supposed that there are several kinds of ichneumons, because there are some larger, and of a different colour from others; but if we consider, that being often reared in houses, they must, like other domestic animals, undergo changes, we shall readily perceive that this diversity of colour and size only indicates simple varieties, not sufficient to constitute a separate species; especially as in the two ichneumons which I have seen alive, and in many stuffed skins I examined, I did not observe that the intermediate shades both of size and colour differed from the rest by any evident and constant character; and it only appears, that in Egypt, where the ichneumons may be said to be domestic, they are larger than those in India, where they are wild.

Nomenclators, who are never willing that a being should be only what it is, have greatly varied on the subject of the ichneumon. Linnæus first made it of the badger kind, and directly after of the ferret. Hasselquist, following the lessons of his master, also makes it a badger. Klein and Brisson have placed it in the weasel class, others in the otter, and some with the rat.* I only quote these ideas to shew the want of consistency, and the contradictions, which are to be met with in what are called generic denominations, and which are generally false, arbitrary, vague, and equivocal.

The ichneumon is fond of living by the sides of rivers. During the inundations it quits its habitation, and even seeks for prey near inhabited places. They walk without making any noise, and change their manner as occasion requires. Sometimes they carry their heads erect, foreshorten their bodies, and

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* Professor Cuvier classes it with the bear.

rise upon their hind-legs; at other times they creep and lengthen their bodies like a serpent. It often sits upon its hind-legs, and more often darts like an arrow upon its prey; its eyes are lively and full of fire; its physiognomy is beautiful, its body very agile, legs short, tail thick and very long, and its hair rough, and sometimes curled. Both male and female have a remarkable orifice, independent of the natural passages; a kind of pouch, in which an odoriferous liquor is secreted; and some have asserted that the ichneumon opens this pouch to refresh itself when too hot. Its nose is very sharp, and its mouth narrow, which prevents it from seizing any thing very large; but these wants are amply supplied by agility and courage. It very easily strangles a cat, though bigger and stronger than itself; it often fights with dogs, and however large commonly gets the better of them.

Their growth is very quick, and their lives but of short duration: they are very common throughout all the southern parts of Asia, from Egypt to Java; and are even to be met with in Africa, as far as the Cape of Good Hope; but they will not live and produce in our temperate climates; they are distressed by wind, and the frost destroys them; to avoid the one, and to counteract the effects of the other by warmth, they roll themselves up with their heads under their bellies. The ichneumon was much esteemed by the ancient Egyptians; and is still protected with much care upon account of the essential service it performs in the destruction of noxious animals, particularly the crocodiles, whose eggs it knows how to discover even in the sand, and which creatures would become very formidable, from their great multiplication, one female laying near five hundred eggs, if it were not that the ichneumons destroy them.

THE FOSSANE.

THIS animal is called by some travellers the *genet of Madagascar*, because it resembles the genet in colour, and some other affinities; but it is in general much smaller, and has not the odoriferous bag, which is an essential character belonging to that animal. As we were not certain as to this fact, not being able to procure one for dissection, we wrote to M. de Poivre, de Poivre, who had sent us the skin of a fossane stuffed, and who favoured us with the following answer:—Lyons, July 19, 1761. "The fossane which I brought from Madagascar is an animal whose manners are much like those of our marten. The inhabitants of the island assured me, that when the male is in heat it emits a very strong smell like musk. When I stuffed the skin which is in the royal gardens I did not discover any bag, nor did I find any odoriferous smell. I reared two similar animals, the one at Cochinchina, and another in the Phillippine Islands; they were both males; I had them very young, and kept them about two or three months, in which time they had become pretty familiar. I never found any bag in the parts you speak of, but only observed that their excrements had the same smell as those of our marten. They eat flesh and fruits, but preferred the latter, and were exceedingly partial to bananas, which they devoured with voracity. This is a very wild animal, and difficult to tame; though taken when very young, yet it preserved the look and character of ferocity, which appeared to me somewhat extraordinary in an animal who feeds by preference on fruits. The eye of the fossane represents a large black globe, in comparison with the size of its head, which gives it a mischievous aspect."

It gives us great pleasure to have here an opportunity of testifying our thanks to M. de Poivre, who from a real taste for natural history, and a friendship for those who cultivate it, has presented to the cabinet a great number of scarce and curious animals.

The animal called *berbé* in Guinea seems to us to be the same as the fossane, and consequently that this species exists in Africa as well as in Asia. "The *berbé* (says Bosman) has a more pointed snout, and a smaller body, than our cat, and is speckled like the civet." We know of no animal with which these characters so well agree as with that of the fossane.

THE VANSIRE.

THOSE who have spoken of this animal have taken it for a ferret, to which indeed it has a great resemblance; but it differs in characters sufficiently strong to warrant our considering it as a distinct species. The vansire, or, as it is called by some, the Madagascar weasel, of which place it is a native, has twelve grinders in its upper jaw, while the ferret has only eight; and the lower grinders, though ten in number in both animals, are neither alike in shape nor situation. Besides, the vansire differs in the colour of its hair from all ferrets, though those, like every other animal which man is careful of rearing and increasing, vary so much in colour, that there is a difference even between male and female.

To us it appears, that the animal mentioned by Seba as the *weasel of Java*, and which, he says, the natives call *koger-angan*, and afterwards spoken of by Brisson by the name of the *ferret of Java*, may possibly be the same animal as the vansire, at least it comes nearer to the vansire than to any animal at present known; but Seba's description is not sufficiently complete to establish a just comparison, which is absolutely necessary to form a solid and explicit judgment.

THE MAKI.*

AS this name Maki has been given to several animals we can only use it as a generic term, under which we comprehend three animals of the same class, but varying in characters sufficiently numerous to constitute different species. These three animals have long tails, and feet shaped like those of the monkey; but their snout is long, like that of the martin; and they have six incisive teeth in the under jaw, while the monkeys have but four.

The first of this kind is the mococo, or maucauco, (*fig*. 173.) commonly known by the name of the *ring-tailed maki*. The second is the mongous, (*fig*. 174.) commonly called the *brown maki;* but this denomination is misapplied, for there are among this kind, various colours, some are all brown, others with white cheeks and feet, and still others whose cheeks are black and feet are yellow. The third is the *vari*, (*fig*. 175.) called by some the *pied maki:* but this denomination has been also misapplied, for besides those which are pied, that

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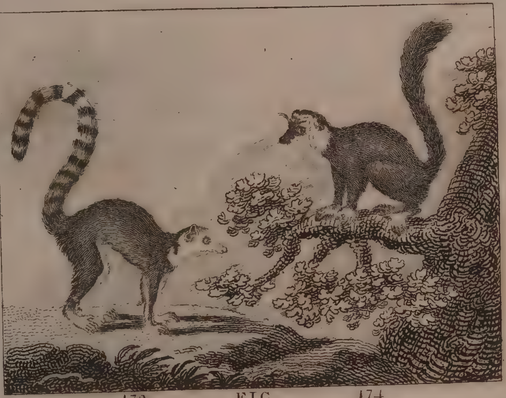
* The word *maki* has probably been derived from *mocock* or *maucauc*, which is the name given to these animals at Mozambique and in the islands of Madagascar, whence it originally proceeded.



173 FIG. 174

Macauco *Mongous*

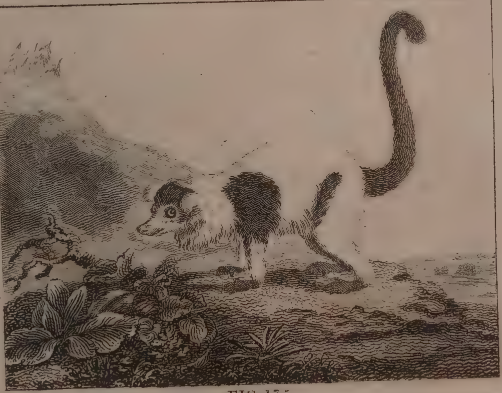


FIG. 175

Vari

that is black and white, there are some all white, and others entirely black. These animals are all natives of the eastern parts of Africa, and principally of Madagascar, where they are found in great numbers.

The maucauco is a beautiful animal; he is remarkable for the largeness of his eyes, and the length of the hind legs, which by far exceed those before, and for his long and handsome tail which is continually elevated, and in motion, and upon which are thirty rings alternately black and white, all very distinct and separate from each other. He is of a gentle disposition, and although he greatly resembles the monkeys in many particulars, he has not any of their malicious dispositions. When in a state of liberty, they are frequently seen at Madagascar in companies of thirty or forty together. This animal is neither mischievous nor ferocious; but as he is always in motion, it is customary to keep him chained when in a state of captivity, for he may be rendered so tame as to be let loose without any danger of his quitting his master. When he moves, it is in an oblique direction, like all animals which have hands instead of feet. He jumps with greater facility than he walks, and is so silent an animal, that his voice is seldom heard, except when irritated, and then he utters a sharp, but very short cry. He sleeps in a sitting posture, with his muzzle resting on his breast. His body is not thicker than that of a cat, but it is longer, and he appears to be larger than he really is from the length of his legs. His hair is very soft, although it stands almost upright. The genital parts of the male maucauco are small and concealed, while those of the mongous are disproportionally large and apparent.

The mongous is less than the maucauco, but his hair is likewise short, silky, and a little curled. His nose is thicker, and resembles that of the vari. I had a mongous in my possession for several years; his coat was brown, his eyes yellow, his nose black, and his ears short. He had a custom of playing with, and biting his own tail, and by this method destroyed four or five of the last vertebræ. He was very slovenly, and so troublesome that we were obliged to keep him chained. Whenever he got loose, he visited the shops in the neighbourhood, and would make free with fruit, sugar, sweetmeats, &c. and to obtain which, he would open the boxes that contained them. At such times it was difficult to retake him, and he would bite even those he best knew. He was almost continually grumbling, and when weary of being alone, he made a loud noise which somewhat resembled the croaking of a frog. This was a male animal, and had extremely large testicles for the size of his body. He was fond of she-cats, but his connection with them was too slight to be productive. He was very fearful of the cold and wet, and never stirred far from the fire-side, where he sat upright to warm himself. He was fed with bread and fruits; his tongue was rough, like that of a cat, and he would lick a person's hand until it became inflamed, and if not guarded against would generally end with a bite. He died with the cold in the winter, 1750, although he never stirred from the fire-side. He was very brisk in his motions, and sometimes petulant. He often slept in the day, or rather dozed, for his sleep was so light, that he was disturbed with the least noise.

There are many varieties of the mongous both in colour and size. The one we have just mentioned was quite brown, and about the size of a middling cat. We saw one which, though adult, was not bigger than the loir. If this small mongous had not perfectly resembled the great one in every respect but in size, it would certainly have been a different species; but the resemblance was so perfect, that we think ourselves justifiable in ranking them together.

The *vari* is much longer, stronger, and wilder, than the maucauco, and is even dangerous in its free state. Travellers tell us, "that these animals are as furious as tigers, and very difficult to be tamed; and that their voice is so very loud, that when there are only two together in the woods, it might be imagined the noise proceeded from a hundred." The voice of the vari is somewhat like the roaring of the lion, and is very alarming to those who hear it for the first time. This astonishing power of voice in an animal of so middling a size, depends on the singular structure of the windpipe, the two branches of which enlarge and form a concavity near its entrance into the tubes of the lungs. Thus he differs greatly from the maucauco both by nature and conformation. His hair in general is much longer, and he has a kind of ruff round the neck, consisting of very long hair, which forms a very apparent character, and by which he may easily be distinguished. In colour he varies from quite black to white, and his hair, though very long and soft, stands very nearly upright. His muzzle is thicker and longer than that of the maucauco. His ears are much shorter, and edged with long hairs; and his eyes are of so deep an orange-colour, that they appear to be red.

The maucauco, the mongous, and the vari, are all of the same country; and seem to be confined to Madagascar, Mozambique, and the neighbouring lands of those islands. It does not appear, by the testimony of any traveller, that they are to be found in any other part of the world; and seem to be in the Old Continent, what the opossums are in the New. In respect to shape, the makis seem to fill up the shade between the long-tailed monkey, and lower orders of quadrupeds; for they have four hands and a long tail like monkeys, and at the same time, have a long muzzle like foxes and polecats. In their manners, the makis, however, partake more of the monkey, for although they sometimes feed upon flesh, and take pains to seize on birds, they are less carnivorous than frugivorous; and even in a domestic state they prefer roots, fruit, and bread, to flesh, raw or roasted.

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